

US EPA RECORDS CENTER REGION 5



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ATTACHMENT I  
RCRA FACILITY INVESTIGATION  
EAST PLANT

RCRA CORRECTIVE ACTION PLAN  
PENNWALT CORPORATION  
MID 005 363 114

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)  
AT  
PENNWALT CORPORATION  
EAST PLANT

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the East Plant, as identified in the Status column of Table 1 of this Scope of Work, and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation.

SCOPE

The RCRA Facility Investigation consists of six tasks:

- Task I:           Description of Current Conditions
- A.   Facility Background
  - B.   Nature and Extent of Contamination
- Task II:           Pre-Investigation Evaluation of Potential Corrective Measure Technologies
- Task III:          RFI Workplan Requirements
- A.   Environmental Setting Characterization Plan
  - B.   Source Characterization Plan
  - C.   Contamination Characterization Plan
  - D.   Potential Receptor Identification Plan
  - E.   Project Management Plan
  - F.   Data Collection Quality Assurance Plan
  - G.   Data Management Plan
  - H.   Health and Safety Plan
  - I.   Community Relations Plan
- Task IV:          Facility Investigation
- Task V:           Investigation Analysis (Draft RFI Reports)
- A.   Data Analysis
  - B.   Protection Standards

Task VI:       Reports

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

## TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for U.S. EPA approval a report providing the background information pertinent to the East Plant and contamination as set forth below. The data gathered during previous investigations or inspections and other relevant data shall be included.

### A. East Plant Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general East Plant physiography, hydrogeology, and historical use of the East Plant for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:
  - a. Topography and surface drainage (with a contour interval of 5 feet and a scale of 1 inch = 200 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface water containment areas;
  - b. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
  - c. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;

- d. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980; and
- e. All known past and present product and waste underground tanks or piping.
- f. Surrounding land uses (residential, commercial, agricultural, recreational).

All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

- 2. To the extent available from diligent inquiry, a history and *description of ownership and operation, including former tenant operations*, and associated solid and hazardous waste generation, treatment, storage and disposal activities at the East Plant including a list of raw materials, products used, by-products generated and location of production areas;
- 3. To the extent available from diligent inquiry, approximate dates or periods of past product and waste spills of [which involved] hazardous waste or hazardous constituents including, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local,

state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past environmental permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the East Plant with respect to these environmental permits.

B. Nature and Extent of Contamination

The Respondent shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This should include all units and areas identified in the Status column of Table 1 of this Scope of Work. For each area, the Respondent shall identify the following:
  - a. Location of unit/area (which shall be depicted on a East Plant map);
  - b. Quantities of solid and hazardous wastes;

- c. Hazardous waste or constituents, to the extent known; and
  - d. Identification of areas where additional information may be necessary.
2. The Respondent shall prepare a preliminary assessment and description of the existing degree and extent of contamination. This should include:
- a. Available monitoring data and qualitative information on locations and levels of contamination at the East Plant;
  - b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
  - c. The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

## TASK II: PRE-INVESTIGATION EVALUATION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES

In accordance with the Schedule, the Respondent shall submit to U.S. EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the East Plant investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

## TASK III: RFI WORKPLAN REQUIREMENTS

The RFI Workplan will be implemented in two phases. The focus of the first phase, "RFI Phase I," involves an investigation of the on-site hydrogeology, soils, surface impoundments (water and sediments), quantification of potential groundwater and soil contamination and a study to identify potential receptors which could be impacted by the contamination, if any, at the East Plant.

The second phase, "RFI Phase II," will be implemented, if necessary, after RFI Phase I has been completed. RFI Phase II will consist of a focused investigation of the river in the vicinity of the East Plant, if necessary, depending upon the results of the RFI Phase I.



Subject to the provisions of Paragraphs XII and XIX of the Consent Order, the RFI Phase II may also consist of a focused investigation of areas beyond the East Plant boundary, to the extent required by RCRA, if a final determination is made based on the RFI Phase I results that: 1) there has been a beyond boundary release of hazardous wastes or constituents from the East Plant; 2) beyond boundary corrective action may be necessary to protect human health and the environment; and 3) pursuant to Paragraph VIII(16) of the Consent Order, additional work is necessary.

Respondent will implement RFI Phase I and, if necessary, RFI Phase II in accordance with Task IV of this Scope of Work.

#### RFI Phase I

The Respondent shall prepare and submit to EPA for approval a RCRA Facility Investigation (RFI) Workplan I within the time period specified in the schedule included herein ("Schedule"). This RFI Workplan I shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the East Plant specific situation. The RFI Workplan I shall describe how the Respondent will conduct the following:

A. Environmental Setting Plan

The Respondent shall develop a plan to collect information to supplement the report entitled Environmental Study Pennwalt East Plant Wyandotte, Michigan, January 1987, and verify the existing information on the environmental setting at the East Plant. The Plan shall include the following tasks:

1. Hydrogeology

The Respondent shall develop a plan to evaluate the following hydrogeologic conditions at the East Plant.

a. A description of the regional and East Plant specific geologic and hydrogeologic characteristics affecting ground water flow beneath the East Plant, including:

- i) Depositional history;
- ii) Identification and characterization of areas and amounts of recharge and discharge;
- iii) Regional and East Plant specific ground water flow patterns; and

- iv) Characterize seasonal variations in the ground water flow regime.
- b. Based on field data, test, and cores, a representative and accurate classification and description of all hydrogeologic units which may be part of the migration pathways at the East Plant (i.e., the aquifers and any intervening saturated and unsaturated units), including:
  - i) Hydraulic conductivity and porosity (total and effective);
  - ii) Lithology, grain size, sorting, degree of cementation;
  - iii) An interpretation of hydraulic interconnections between saturated zones; and
  - iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).
- c. Based on field studies, cores, and structural geology, construct hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units, including bedrock, which may be part of the migration pathways identifying:

- i) All sand and gravel deposits in consolidated deposits;
- ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
- iii) Zones of high permeability or low permeability that might direct and restrict the flow of contaminants;
- iv) Any aquifer: confined or unconfined, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and
- v) Water bearing zones that may serve as a pathway for contaminant migration including perched zones of saturation.

d. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

- i) Water level contour and/or potentiometric maps;
- ii) Hydrologic cross sections showing vertical gradients;

- iii) The flow system, including the vertical and horizontal components of flow; and
  - iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.
- e. A description of man made influences that may affect the hydrogeology of the site, identifying:
- i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
  - ii) Man made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

## 2. Soils

The Respondent shall develop a plan to characterize the natural soil units above the water table at the East Plant. Such characterization shall include but not be limited to, the following information:

- a. Transects of soil stratigraphy;
- b. Hydraulic conductivity (saturated and unsaturated);

- c. Relative permeability;
- d. Bulk density;
- e. Porosity;
- f. Soil sorptive capacity;
- g. Cation exchange capacity (CEC);
- h. Soil organic content;
- i. Soil pH;
- j. Particle size distribution;
- k. Depth of water table;
- l. Effect of stratification on unsaturated flow;
- m. Infiltration;
- n. Storage capacity; and
- o. Vertical flow rate.

### 3. Surface Impoundments and Sediment

The Respondent shall develop a plan to characterize the surface impoundments at the East Plant. Such characterization shall include, but not be limited to, the following activities and information:

- a. Description of the surface impoundments including:
- b. Description of the chemistry of the water and sediments in the surface impoundments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ), chemical oxygen demand, total organic carbon, specific contaminant concentrations.
- c. Description of sediment characteristics including:
  - i) Depositional area;
  - ii) Thickness profile; and
  - iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity and pH.

**B. Source Characterization Plan**

The Respondent shall develop a plan to collect analytical data for waste characterization in the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and East Plant characteristics affecting release (e.g., East Plant security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

**1. Unit/Disposal Area characteristics:**

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;
- c. Design features;
- d. Operating practices (past and present);
- e. Period of operation;
- f. Age of unit/disposal area;
- g. General physical conditions; and



h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) pH;

iv) General chemical class (e.g., acid, base, solvent);

v) Density;

vi) Viscosity;

vii) Solubility in water;

viii) Cohesiveness of the waste;

ix) Vapor pressure; and

x) Flash point.

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration,  
biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization Plan

The Respondent shall develop a plan to collect analytical data on ground water, soils and surface impoundments at the East Plant. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identify of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the East Plant:

1. Ground Water Contamination

The Respondent shall develop a ground water investigation plan to characterize any plumes of contamination at the East Plant. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the East Plant;
- b. The horizontal and vertical direction of contamination movement;
- c. The velocity of contaminant movement;

- d. The horizontal and vertical concentration profiles of Appendix IX constituents plus those parameters characteristic of the waste, identified during a literature review, in the plume(s);
- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

## 2. Soil Contamination

The Respondent shall develop a plan to characterize the contamination of the soil fill above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination;
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange

capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;

- c. Specific contaminant concentrations;
- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement; and

The Respondent shall document the procedures used in making the above determinations.

### 3. Surface Impoundments and Sediment Contamination

The Respondent shall develop a surface impoundment investigation plan to characterize contamination in surface impoundments.

The investigation shall include, but not be limited to, the following information:

- a. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations;

- b. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the impoundments;
- c. The horizontal and vertical direction of contaminant movement;
- d. The contaminant velocity;
- e. An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- f. An extrapolation of future contaminant movement; and

The Respondent shall document the procedures used in making the above determinations.

#### 4. Air Contamination

The Respondent shall develop an air contamination investigation plan to characterize the particulate and gaseous contaminants released to the atmosphere from the units and other source areas identified in the Status column of Table One, or document why there is no need to conduct an investigation. This investigation, if required, shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of the release; and
- c. The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Respondent shall develop a plan to characterize subsurface gases in the groundwater emitted from buried hazardous waste and hazardous constituents from the units and other source areas identified in the Status column of Table One, or document why there is no need to conduct an investigation. This investigation, if required, shall include the following information:

- a. A description of the horizontal and vertical extent of subsurface gases mitigation;
- b. The chemical composition of the gases being emitted;

- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

D. Potential Receptor Identification Plan

The Respondent shall develop a plan to collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the East Plant. The plan will also require a literature search and review of relevant existing data on the chemical analysis of biological data and on observable effects in ecosystems. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:
  - a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
  - b. Location of ground water users including wells and discharge areas within a one mile radius of the East Plant.



2. Local uses and possible future uses of surface waters draining the East Plant:

- a. Domestic and municipal (e.g., potable and lawn/garden watering);
- b. Recreational (e.g., swimming, fishing);
- c. Agricultural;
- d. Industrial; and
- e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the East Plant and adjacent lands, including but not limited to:

- a. Recreation;
- b. Hunting;
- c. Residential;
- d. Commercial;
- e. Zoning; and

- f. Relationship between population locations and prevailing wind direction.
- 4. A description of the biota in surface water bodies on, adjacent to, or affected by the East Plant.
- 5. A description of the ecology overlying and adjacent to the East Plant.
- 6. A demographic profile of the people who use or have access to the East Plant and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
- 7. A description of any endangered or threatened species near the East Plant.

E. Project Management Plan

The Respondent shall prepare a Project Management Plan which will include discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

## **F. Data Collection Quality Assurance Plan**

The Respondent shall prepare a plan to document all monitoring procedures: Sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination. The plan is intended to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

### **1. Data Collection Strategy**

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

- a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;
- b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
- c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:

- i) Environmental conditions at the time of sampling;
  - ii) Number of sampling points;
  - iii) Representativeness of selected media; and
  - iv) Representativeness of selected analytical parameters.
- d. Description of the measures to be taken to assure that the following data sets can be compared to each other:
  - i) RFI data generated by the Owner/Operator over some time period;
  - ii) RFI data generated by an outside laboratory or consultant versus data generated by the Owner/Operator;
  - iii) Data generated by separated consultants or laboratories; and
  - iv) Data generated by an outside consultant or laboratory over some time period.
- e. A description of frequency of monitoring and information to be provided in quality assurance reports. The reports should include but not limited to:

- i) Periodic assessment of measurement data accuracy, precision, and completeness;
- ii) Results of performance audits;
- iii) Results of system audits;
- iv) Significant quality assurance problems and recommended solutions; and
- v) Resolutions of previously stated problems.

## 2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss the following:

- a. Selecting appropriate sampling locations, depths, etc.;
- b. Providing a statistically sufficient number of sampling sites;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which sampling should be conducted;

- e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of sampling and length of sampling period;
- h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- i. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- j. Documenting field sampling operations and procedures, including:
  - i) Documentation of procedure for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
  - ii) Procedure and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation method;

- iv) Calibration of field devices;
  - v) Collection of replicate samples;
  - vi) Submission of field-biased blanks, where appropriate;
  - vii) Potential interferences present at the East Plant;
  - viii) Construction materials and techniques, associated with monitoring wells and piezometers;
  - ix) Sampling order; and
  - x) Decontamination procedures.
- k. Selecting appropriate sample containers;
- l. Sample preservation; and
- m. Chain-of-custody, including:
- 1) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and

- ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

### 3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

- a. Selecting appropriate field measurement locations, depths, etc.;
- b. Providing a statistically sufficient number of field measurements;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which field measurement should be conducted;
- e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of field measurement and length of field measurement period; and



h. Documenting field measurement operations and procedures, including:

- i) Procedures and forms for recording raw data and the exact location, time, and East Plant-specific considerations associated with the data acquisition;
- ii) Calibration of field devices;
- iii) Collection of replicate measurements;
- iv) Submission of field-biased blanks, where appropriate;
- v) Potential interferences present at the East Plant;
- vi) Construction materials and techniques associated with monitoring wells and piezometers use to collect field data;
- vii) Field equipment listing;
- viii) Order in which field measurements were made; and
- ix) Decontamination procedures.

#### 4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

- i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
- ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
- iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

- i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology; and
  - v) Method detection of limits.
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting;
- g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
  - i) Method blank(s);
  - ii) Laboratory control sample(s);
  - iii) Calibration check sample(s);
  - iv) Replicate sample(s);
  - v) Matrix-spiked sample(s);

- vi) "Blind" quality control sample(s);
- vii) Control charts;
- viii) Surrogate samples;
- ix) Zero and span gases; and
- x) Reagent quality control checks.

A performance audit will be conducted by U.S. EPA on the laboratories selected by the Respondent. This audit must be completed and approved prior to the approval of the Quality Assurance Procedure Plan (QAPP) for the East Plant.

- h. Preventive maintenance procedures and schedules;
- i. Corrective action (for laboratory problems); and
- j. Turnaround time.

#### G. Data Management Plan

The Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file

requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

## 1. Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;
- b. Sampling or field measurement location and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measured; and
- f. Result of analysis (e.g., concentration).

## 2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;

- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis;
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

### 3. Graphical Displays

Both historical data and data required as part of this RFI shall be presented in generally accepted formats for ease of interpretation. The data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc). The application of graphical displays shall be used to:

- a. Display sampling location and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data are required;
- c. Display levels of contamination at each sampling location;
- d. Display geographical extent of contamination;

- e. Display contamination levels, averages, and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- g. Indicate features affecting intramedia transport and show potential receptors.

#### H. Health and Safety Plan

The Respondent shall prepare a East Plant Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:
  - a. East Plant description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted including, but not limited to, on and off-site exposure to contaminants during the implementation of interim measures at the East Plant;
  - c. list key personnel and alternates responsible for site safety, response operations, and for protection of public health;
  - d. Delineate work area;

- e. Describe levels of protection to be worn by personnel in work area;
  - f. Establish procedures to control site access;
  - g. Describe decontamination procedures for personnel and equipment;
  - h. Establish site emergency procedures;
  - i. Address emergency medical care for injuries and toxicological problems;
  - j. Describe requirements for an environmental surveillance program;
  - k. Specify any routine and special training required for responders; and
  - l. Establish procedures for protecting workers from weather-related problems.
2. The East Plant Health and Safety Plan shall be consistent with:
- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
  - b. U.S. EPA Order 1440.1 - Respiratory Protection;



- c. U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- d. East Plant Contingency Plan;
- e. U.S. EPA Standard Operating Safety Guide (1984);
- f. OSHA regulations particularly in 29 CFR 1910 (as amended on December 19, 1986) and 1926;
- g. State and local regulations; and
- h. Other U.S. EPA guidance as provided.

#### I. Community Relations Plan

The Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

#### RFI Phase II

Based upon the results of and recommendations provided by the Respondent in the final RFI Phase I Report, a determination will be made as to the need for an RFI Phase II focusing on the river in the vicinity of the East Plant. U.S. EPA will provide written notice of the determination to Respondent. Within 90 days after receipt of a determination that an RFI Phase II is needed,

Respondent shall submit an RFI Phase II Workplan. The focus of the RFI Phase II, if required, will be to characterize the river water and sediments in the vicinity of the East Plant for specific contaminants of interest, if any, identified in U.S. EPA's written determination of the need for an RFI Phase II, based on the information presented in the final RFI Phase I Report.

RFI Workplan II shall describe how the Respondent will conduct the following:

A. Environmental Setting Plan

To supplement the Environmental Setting program established during RFI Phase I, the Respondent shall develop a plan to characterize the surface water in the vicinity of the East Plant. Such characterization shall include the following activities and information:

1. A description including:
  - a. Location elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies;
  - b. Drainage patterns; and
  - c. Evapotranspiration.
2. A description of the chemistry of the surface water and sediments. This includes determining the pH, total dissolved solids, total

suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ), chemical oxygen demand, total organic carbon, specific contaminant concentrations.

3. A description of sediment characteristics within the vicinity of the East Plant including:
  - a. Deposition area;
  - b. Thickness profile; and
  - c. Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity and pH).

B. Contamination Characterization Plan

The scope of this program will be contingent upon the findings of the RFI Phase I. The Respondent shall develop a plan to collect analytical data on surface water and sediment in the vicinity of the East Plant. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminants of interest, if any, identified in the RFI Phase I as potentially affecting the surface water and sediment in the vicinity of the East Plant. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of all individuals performing the sampling and analysis.

C. Potential Receptor Identification Plan

The Respondent shall modify, if necessary, the plan established for RFI Phase I to reflect the activities of RFI Workplan II.

D. Data Collection Quality Assurance Plan

The Respondent shall modify, if necessary, guidelines established for this plan in RFI Phase I(F).

E. Data Management Plan

The Respondent shall modify, if necessary, guidelines established for this plan in RFI Phase I(G).

F. Project Management Plan, Health and Safety Plan, Community Relations Plan

The Respondent shall modify, if necessary, plans established for RFI Phase I to reflect the activities of RFI Workplan II.

#### TASK IV: FACILITY INVESTIGATION

Upon notice of EPA approval, the Respondent shall implement RFI Workplan I, and subsequent RFI Workplan II, if required, pursuant to the approved schedules therein which set forth those investigations necessary to: characterize the East Plant (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task II. All sampling and analysis shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

## TASK V: INVESTIGATION ANALYSIS

The Respondent shall prepare and submit to EPA, in accordance with the schedule herein, a draft RFI Report for Phase I, and, if necessary, a subsequent draft RFI Report for Phase II, that shall contain an analysis and summary of all East Plant investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study. The draft RFI Report for Phase I shall also include all data gathered during the Phase I and II studies conducted by the Respondent and presented in the January 1987 Report.

### A. Data Analysis

The Respondent shall analyze all East Plant investigation data obtained in Task III and the previous studies and prepare a report(s) on the type and extent of contamination at the East Plant including sources and migration pathways. The report(s) shall describe the extent of contamination, (qualitative/quantitative) in relation to background levels indicative for the area identify the applicable health and environmental criteria and assess the potential threat to human health and the environment. U.S. EPA will use the report(s) to determine the need for corrective measures with respect to each Solid Waste Management Unit ("SWMU") and other potential source area studied in the RFI. Pursuant to Paragraph VIII(7) of this

Order, U.S. EPA shall make preliminary written determination as to the need for a CMS, identifying which SWMU's require corrective action and shall submit a copy of the preliminary determination to Respondent.

B. Protection Standards

1. Ground Water Protection Standards

The Respondent shall provide information to support the Agency's selection/development of Ground Water Protection Standards for all of the constituents of interest found in the ground water during the Facility Investigation (Task III).

a. The Ground Water Protection Standards shall consist of:

- i) for any constituents listed in Table 1 of 40 CFR 264.94, the respective value given in the table (MCL) if the background level of the constituent is below the given in Table 1; or
- ii) the background level of that constituent in the ground water; or
- iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

- b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by the Respondent in accordance with U.S. EPA guidance. For any proposed ACL's the Respondent shall include a justification based upon the criteria set forth in. 40 CFR 264.94(b).
- c. The U.S. EPA shall notify the Respondent in writing of approval, disapproval or modifications, at any proposed ACL, the notice shall include the reason(s) for any disapproval or modification; and
- d. Within thirty (30) days of receipt of the U.S. EPA's notification of disapproval of any proposed ACL, the Respondent shall amend and submit revisions to the U.S. EPA.

## 2. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).



## TASK VI: REPORTS

### A. Preliminary and Workplan

The Respondent shall submit to the U.S. EPA reports on Task I and II and the RCRA Facility Investigation Workplans (Task III) in accordance with the Schedule.

### B. Progress

The Respondent shall at a minimum provide the U.S. EPA with signed, bimonthly progress reports containing the following information with respect to the RFI program:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, and summaries of laboratory/monitoring data.

C. Draft and Final

Upon U.S. EPA approval, the Respondent shall prepare the RCRA Facility Investigation Phase I, and, if necessary, Phase II, Report(s) to present Tasks III-IV. The RCRA Facility Investigation Report(s) shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Report(s) shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report(s).

Five (5) copies of all reports, including the Task I report, Task II report, Task III workplan(s), and both the Draft and Final RCRA Facility Investigation Phase I, and, if necessary, Phase II, Reports (Task III-IV) shall be provided by the Respondent to U.S. EPA.

### East Plant Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

EAST PLANT SUBMISSION	DUE DATE *
TASK I: DESCRIPTION OF CURRENT CONDITIONS	WITHIN 120 DAYS OF EFFECTIVE DATE OF ORDER
TASK II: PRE-INVESTIGATION EVALUATION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES	WITHIN 180 DAYS OF EFFECTIVE DATE OF ORDER
TASK III: RFI WORKPLAN I	WITHIN 180 DAYS OF EFFECTIVE DATE OF ORDER
TASK IV: IMPLEMENTATION OF APPROVED RFI WORKPLAN I	IN ACCORDANCE WITH THE SCHEDULE IN THE APPROVED RFI WORKPLAN I
TASK III: RFI WORKPLAN II	WITHIN 90 DAYS OF U.S. EPA NOTICE TO IMPLEMENT RFI PHASE II
TASK IV: IMPLEMENTATION OF APPROVED RFI WORKPLAN II	IN ACCORDANCE WITH THE SCHEDULE IN THE APPROVED RFI WORKPLAN II
TASK V: DRAFT RFI REPORT I	IN ACCORDANCE WITH SCHEDULE IN THE APPROVED RFI WORKPLAN I
TASK V: FINAL RFI REPORT I	WITHIN 60 DAYS OF RECEIPT OF U.S. EPA COMMENTS <sup>1</sup> ON DRAFT RFI REPORT I

<sup>1</sup>As finalized through Paragraph XVIII of this Order.

\*All due dates are calculated from the effective date of this Order unless otherwise specified.

FACILITY SUBMISSION	DUE DATE *
TASK VI: DRAFT RFI REPORT II	IN ACCORDANCE WITH SCHEDULE IN RFI PHASE II WORKPLAN
TASK VI: FINAL RFI REPORT II	WITHIN 60 DAYS OF RECEIPT OF U.S. EPA COMMENTS <sup>1</sup> ON DRAFT RFI REPORT II
TASK VI: PROGRESS REPORTS ON TASKS I THROUGH V	BIMONTHLY BY THE 15TH DAY OF THE MONTH FOLLOWING THE COMPLETED REPORTING PERIOD

<sup>1</sup>As finalized through Paragraph XVIII of this Order.

\*All due dates are calculated from the effective date of this Order unless otherwise specified.

EAST PLANT SCOPE OF WORK

TABLE ONE

Solid Waste Management Units  
And Other Source Areas

<u>A.</u> <u>Identification</u>	<u>B.</u> <u>Description</u>	<u>C.</u> <u>Contents</u>	<u>D.</u> <u>Status*</u>
1) Tank 103 (Currently operated by PVS)	50,000 gal. tank	Spent pickle liquor for manu- facturing; cor- rosive, EP toxic for lead and chromium	Included; limited soil borings and analytical screening for characteristic metals
2) Tank 104 (Currently operated by PVS)	50,000 gal. tank	Spent pickle liquor for manu- facturing; cor- rosive, EP toxic for lead and chromium	Included; limited soil borings and analytical screening for characteristic metals
3) Tank 4	1,100 gal. tank; indoor	Waste sulfuric acid; RCRA certified closure	Included; limited to inspection of containment sump integrity
4) Tank 6A	3,000 gal. tank; indoor	Waste sulfuric acid; RCRA certified closure	Included; limited to inspection of containment sump integrity
5) Drum Storage Containment Pad	40' x 60' curbed, reinforced, concrete pad	Used for storage of drums; RCRA certified closure	Included; limited to inspection of containment pad integrity
6) Tank 1	10,000 gal. tank; indoor	Spent scrubber solution; cor- rosive; closed	Included; limited to inspection of containment sump integrity
7) Anhydrous Ferric Chloride Container (Currently operated by PVS)	10' x 12' indoor area, concrete floor and sump	Furnace plugs; corrosive when wet and EP toxic for lead	Included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

<u>A.</u> <u>Identification</u>	<u>B.</u> <u>Description</u>	<u>C.</u> <u>Contents</u>	<u>D.</u> <u>Status*</u>
8) PCB Storage Area	225 ft <sup>2</sup> indoor area	Drummed PCB oils and other PCB containing materials; closed	Not included
9) Asbestos Storage Area	400 ft <sup>3</sup> indoor area	Used asbestos; area emptied and dismantled	Not included
10) Underground Injection Wells	3 Class V underground injection wells; will be closed under VIC program	Brine purification muds and sediments, calcium carbonate and magnesium hydroxide in sodium chloride solution (non-hazardous)	Not included
11) NPDES Neutralization Tanks	5 tanks of concrete and/or steel	Associated with Outfall 003 and former Outfalls 002 and 005	Included; limited soil borings and analytical screening near tanks
12) NPDES Surface Impoundments (a.k.a. Ponds 1 and 2)	2 surface impoundments; 2 million gal. total volume	Non-hazardous solids; associated with former Outfall 005	Included
13) Former Landfill No. 5 (a.k.a. Burn Area)	Landfill	Refuse, construction and demolition rubble, chlorine cell parts, wastes from manufacturing of orthosilicate and calcium hypochlorite; waste oil burned in area, drummed caustic wastes temporarily stored	Included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

	<u>A.</u> <u>Identification</u>	<u>B.</u> <u>Description</u>	<u>C.</u> <u>Contents</u>	<u>D.</u> <u>Status*</u>
14)	Reject Liquor Tank (Currently operated by PVS)	100,000 gal. tank, rubber lined	Formerly stored reject calcium hypochlorite material	Included
15)	Former Coal Pile Storage and/or Runoff Areas	Coal pile and runoff areas	Coal and coal runoff	Included
16)	Ferric Chloride Processing Area (Currently operated by PVS)	Includes 12' x 12' copper recovery pad (concrete) with concrete wall	Sludge from reduction tanks	Included
17)	Halowax Area	Area of contamination associated with former Halowax operations	Tenant companies produced chlorinated naphthalenes	Included
18)	Former Ammonium Chloride Plant	Plant included Buildings 64 and 64B	Former process operation	Included
19)	Former Synthetic HCl Plant	Plant included Buildings 64 and 64B	Former process operation	Included
20)	Buildings 35A and 38A	Area between where Buildings 35A and 38A were formerly located	Former production buildings	Included
21)	Former Lime Sludge Storage/ Disposal Area	Waste pile/ landfill	Lime sludges	Included
22)	Former Mond Gas Area	Plant including Building 107	Formerly produced coal gas for on-site power plant	Included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

	<u>A.</u> <u>Identification</u>	<u>B.</u> <u>Description</u>	<u>C.</u> <u>Contents</u>	<u>D.</u> <u>Status*</u>
23)	Former Taylor Chemical Area	Plant included Building 107	Tenant company produced CS <sub>2</sub> , carbon tetrachloride and monochlorobenzene	Included
24)	Wyandotte Oil and Fat Plant	Plant included Buildings 71A, 71 and 16	Tenant company produced hydrogenated fish oil	Included
25)	Monitoring Well No. 12 Area	Near Building 79	Trace levels of Arochlor 1254	Included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

SRO/15737/0037/AH4/1



PERFORMANCE AUDIT  
LABORATORY INSPECTION

Laboratory/Name and Address:

Inspection Date:

Person(s) Contacted:

Parameters Determined/Audit Results:

Contract Lab/Name and Address:

Inspection Date:

Person(s) Contacted:

Parameters Determined/Audit Results:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

DATE April 1, 1981

ATTACHMENT NO 1A

/ O.F. 40

SUBJECT Data Set: EDO 582 (Pennwalt Corporation)

FROM Curtis Ross, Director  
Central Regional Laboratory

TO A.R. Winkhofer, Chief  
Eastern District Office (5SED)

The following samples were received at the Central Regional Laboratory and analyzed for the requested parameters:

<u>CRL SAMPLE #</u>	<u>ORIGIN</u>	<u>PARAMETERS REQUESTED</u>
81-EL02S02	001 (11/04/80)	VOA
81-EL02S03	001 (11/05/80)	GC/MS Scan, VOA
81-EL02S05	002 (11/04/80)	VOA
81-EL02S06	002 (11/05/80)	GC/MS Scan, VOA
81-EL02S08	003 (11/07/80)	VOA
81-EL02S09	003 (11/05/80)	GC/MS Scan, VOA
81-EL02S12	005 (11/05/80)	GC/MS Scan
81-EL02S13		GC/MS Scan
81-EL02S14	006 (11/04/80)	VOA
81-EL02S15	006 (11/05/80)	VOA
81-EL02S22	Inf. Pond #2 (11/04/80)	GC/MS Scan, VOA
81-EL02S28	Inf. Pond #1 (11/04/80)	GC/MS Scan, VOA
81-EL02S30	Inf. Pond #4 (11/04/80)	VOA
81-EL02S31	<del>Inf.</del> Pond #4 (11/05/80)	GC/MS Scan, VOA
81-EL02S32	MONGUAGON CREEK SEDIMENT	GC/MS Scan
81-EL02R33	Blank	GC/MS Scan, VOA

An analytical summary of the above is shown in the attached Tables.

If you have any questions regarding these analyses, please contact me at (FTS) 353-8370 or Robert Glowacky at (FTS) 886-3578.

Attachment

Bob,  
Note several volatile  
compounds were detected in  
the Reagent Blank. I can  
not explain their presence.  
Art 4/13/81

## Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S02 (001)

Compound	Amount (PPB)
Propane, 1,2-dichloro-	3.2
Ethene, trichloro-	0.1
Ethene, tetrachloro-	0.2

## FINAL REPORT

ATTACHMENT NO1A

3 OF 40

MS DATA FILE FRN: 7522

NAME: EL02S03 ED0 582

MISC DATA: 2-17-81

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	1,3-DICHLOROBENZENE	LESS THAN 1.0
2	1,4-DICHLOROBENZENE	LESS THAN .7
3	HEXACHLOROETHANE	LESS THAN 1.3
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN 1.2
5	N-NITROSODIPROPYLAMINE	LESS THAN 1.2
6	NITROBENZENE	LESS THAN .6
7	ISOPHORONE	LESS THAN .3
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN .5
9	1,2-DICHLOROBENZENE	LESS THAN .9
10	1,2,4-TRICHLOROBENZENE	LESS THAN .8
11	NAPHTHALENE	LESS THAN .2
12	HEXACHLOROBUTADIENE	LESS THAN 1.5
13	2-CHLORONAPHTHALENE	LESS THAN .4
14	ACENAPHTHYLENE	LESS THAN .3
15	DIMETHYLPHTHALATE	LESS THAN .4
16	2,6-DINITROTOLUENE	LESS THAN 2.4
17	ACENAPHTHENE	LESS THAN .4
18	2,4-DINITROTOLUENE	LESS THAN 1.4
19	FLUORENE	LESS THAN .4
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN .6
21	DIETHYLPHTHALATE	LESS THAN .4
22	1,2-DIPHENYLHYDRAZINE	LESS THAN 7.8
23	N-NITROSODIPHENYLAMINE	LESS THAN .8
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN 1.5
25	HEXACHLOROBENZENE	LESS THAN 1.3
26	1-CHLORONAPHTHALENE	LESS THAN .4
27	PHENANTHRENE/ANTHRACENE	LESS THAN .4
28	FLUORANTHENE	LESS THAN .5
29	PYRENE	LESS THAN .9
30	DI-N-BUTYLPHTHALATE	LESS THAN .5
31	BUTYL BENZYLPHTHALATE	LESS THAN 5.7
32	CHRYSENE	LESS THAN 14.9
33	BENZO(A)ANTHRACENE	LESS THAN 14.9
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN 1.1
35	DI-N-OCTYLPHTHALATE	LESS THAN 2.4
36	BENZO(B)FLUORANTHENE	LESS THAN 1.6
37	BENZO(A)PYRENE	LESS THAN 3.0
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN 1.0
39	DIBENZO(A,H)ANTHRACENE	LESS THAN 2.2
40	BENZO(G,H,I)PERYLENE	LESS THAN 9.3
41	DIBROMOBIPHENYL (ISTD)	29.9

FINAL REPORT

ATTACHMENT NO1A

4 OF 40

MS DATA FILE FRN: 7522

NAME: EL02S03 EDO 582

MISC DATA: 2-17-81

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	I-10 PHENANTHRENE	30.0	
1	2-NITROPHENOL	LESS THAN	2.4
2	2-CHLOROPHENOL	LESS THAN	.8
3	PHENOL	LESS THAN	.7
4	2,4-DIMETHYLPHENOL	LESS THAN	.8
5	2,4-DICHLOROPHENOL	LESS THAN	1.1
6	P-T-BUTYLPHENOL	LESS THAN	.5
7	P-CHLORO-M-CRESOL	LESS THAN	1.2
8	2,4,6-TRICHLOROPHENOL	LESS THAN	1.9
9	PENTACHLOROPHENOL	LESS THAN	9.2
10	4-NITROPHENOL	LESS THAN	10.2

## Purgeable Fraction

EDO-582 (Pennewalt): 81-EL02S03 (001)

Compound	Amount (PPB)
Ethane,1,1,1-trichloro-	0.2
Propane,1,2-dichloro-	0.4
Ethene,tetrachloro-	0.5

Purgeable Fraction

ATTACHMENT NO 1A

6 OF 40

Sample: EDO-582 (Pennwalt): 81-EL02S05 (002)

Compound	Amount (PPB)
Methane, trichloro-	1.4
Methane, tetrachloro-	0.8
Propane, 1,2-dichloro-	10
Ethene, trichloro-	0.1
Ethene, tetrachloro-	0.1

# FINAL REPORT

MS DATA FILE FRN: 7525

ATTACHMENT 1N01A

7 OF 40

NAME: EL02S06 FV 1

MISC DATA:

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	1,3-DICHLOROBENZENE	LESS THAN	1.0
2	1,4-DICHLOROBENZENE	LESS THAN	.7
3	HEXACHLOROETHANE	LESS THAN	1.3
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN	1.2
5	N-NITROSODIPROPYLAMINE	LESS THAN	1.2
6	NITROBENZENE	LESS THAN	.6
7	ISOPHORONE	LESS THAN	.3
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN	.5
9	1,2-DICHLOROBENZENE	LESS THAN	.9
10	1,2,4-TRICHLOROBENZENE	LESS THAN	.7
11	NAPHTHALENE	LESS THAN	.2
12	HEXACHLOROBUTADIENE	LESS THAN	1.4
13	2-CHLORONAPHTHALENE	LESS THAN	.4
14	ACENAPHTHYLENE	LESS THAN	.3
15	DIMETHYLPHTHALATE	LESS THAN	.4
16	2,6-DINITROTOLUENE	LESS THAN	2.3
17	ACENAPHTHENE	LESS THAN	.4
18	2,4-DINITROTOLUENE	LESS THAN	1.4
19	FLUORENE	LESS THAN	.4
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN	.6
21	DIETHYLPHTHALATE	/3	
22	1,2-DIPHENYLHYDRAZINE	LESS THAN	7.6
23	N-NITROSODIPHENYLAMINE	LESS THAN	.7
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN	1.5
25	HEXACHLOROBENZENE	LESS THAN	1.3
26	1-CHLORONAPHTHALENE	LESS THAN	.4
27	PHENANTHRENE/ANTHRACENE	LESS THAN	.4
28	FLUORANTHENE	LESS THAN	.5
29	PYRENE	LESS THAN	.9
30	DI-N-BUTYLPHTHALATE	LESS THAN	.5
31	BUTYL BENZYLPHTHALATE	LESS THAN	5.5
32	CHRYSENE	LESS THAN	14.4
33	BENZO(A)ANTHRACENE	LESS THAN	14.4
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN	1.1
35	DI-N-OCTYLPHTHALATE	LESS THAN	2.4
36	BENZO(B)FLUORANTHENE	LESS THAN	1.6
37	BENZO(A)PYRENE	LESS THAN	2.9
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN	1.0
39	DIBENZO(A,H)ANTHRACENE	LESS THAN	2.1
40	BENZO(G,H,I)PERYLENE	LESS THAN	9.0
41	DIBROMOBIPHENYL (ISTD)	29.1	



# FINAL REPORT

ATTACHMENT NO. 1  
8 DE 40

MS DATA FILE FRN: 7525

NAME: EL02S06 FV 1

MISC DATA:

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

		NAME	CONCENTRATION ( UG/L )
STANDARD	D-10	PHENANTHRENE	30.0
1		2-NITROPHENOL	LESS THAN 2.4
2		2-CHLOROPHENOL	LESS THAN .8
3		PHENOL	LESS THAN .7
4		2,4-DIMETHYLPHENOL	LESS THAN .8
5		2,4-DICHLOROPHENOL	LESS THAN 1.1
6		P-T-BUTYLPHENOL	LESS THAN .5
7		P-CHLORO-M-CRESOL	LESS THAN 1.2
8		2,4,6-TRICHLOROPHENOL	LESS THAN 1.9
9		PENTACHLOROPHENOL	LESS THAN 9.0
10		4-NITROPHENOL	LESS THAN 9.9

Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S06 (002)

Compound	Amount (PPB)
Methane, trichloro-	1.5
Ethane, 1,1,1-trichloro-	0.2
Propane, 1,2-dichloro-	2.6
Ethene, trichloro-	0.1
Ethene, tetrachloro-	0.4

~~Fraction~~ Fraction  
PAGE 12

ATTACHMENT NO 1  
10 OF 40

Sample: EDO-582 (Pennwalt): 81-EL02S08 (003)

Compound	Amount (PPB)
Methane, trichloro-	0.4
Propane, 1,2-dichloro-	2.4
Ethene, tetrachloro-	0.2

# FINAL REPORT

MS DATA FILE FRN: 7524

ATTACHMENT NO 1

11 OF 40

NAME: EDO 582 EL02S09 FV 1

MISC DATA: 2-17-81

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	1,3-DICHLOROBENZENE	LESS THAN	.9
2	1,4-DICHLOROBENZENE	LESS THAN	.6
3	HEXACHLOROETHANE	LESS THAN	1.1
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN	1.1
5	N-NITROSODIPROPYLAMINE	LESS THAN	1.0
6	NITROBENZENE	LESS THAN	.5
7	ISOPHORONE	LESS THAN	.3
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN	.4
9	1,2-DICHLOROBENZENE	LESS THAN	.8
10	1,2,4-TRICHLOROBENZENE	LESS THAN	.7
11	NAPHTHALENE	LESS THAN	.2
12	HEXACHLOROBUTADIENE	LESS THAN	1.3
13	2-CHLORONAPHTHALENE	LESS THAN	.4
14	ACENAPHTHYLENE	LESS THAN	.2
15	DIMETHYLPHTHALATE	LESS THAN	.4
16	2,6-DINITROTOLUENE	LESS THAN	2.1
17	ACENAPHTHENE	LESS THAN	.3
18	2,4-DINITROTOLUENE	LESS THAN	1.2
19	FLUORENE	LESS THAN	.4
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN	.5
21	DIETHYLPHTHALATE	7.4	
22	1,2-DIPHENYLHYDRAZINE	LESS THAN	6.8
23	N-NITROSODIPHENYLAMINE	LESS THAN	.7
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN	1.3
25	HEXACHLOROBENZENE	LESS THAN	1.1
26	1-CHLORONAPHTHALENE	LESS THAN	.4
27	PHENANTHRENE/ANTHRACENE	LESS THAN	.4
28	FLUORANTHENE	LESS THAN	.4
29	PYRENE	LESS THAN	.8
30	DI-N-BUTYLPHTHALATE	LESS THAN	.4
31	BUTYL BENZYLPHTHALATE	LESS THAN	4.9
32	CHRYSENE	LESS THAN	12.8
33	BENZO(A)ANTHRACENE	LESS THAN	12.8
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN	1.0
35	DI-N-OCTYLPHTHALATE	LESS THAN	2.1
36	BENZO(B)FLUORANTHENE	LESS THAN	1.4
37	BENZO(A)PYRENE	LESS THAN	2.6
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN	.9
39	DIBENZO(A,H)ANTHRACENE	LESS THAN	1.9
40	BENZO(G,H,I)PERYLENE	LESS THAN	8.0
41	DIBROMOBIPHENYL (ISTD)	32.9	

# FINAL REPORT

MS DATA FILE FRN: 7524

ATTACHMENT NO 1 A

NAME: EDO 582 EL02509 FV 1

12 OF 40

MISC DATA: 2-17-81

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	2-NITROPHENOL	LESS THAN	2.1
2	2-CHLOROPHENOL	LESS THAN	.7
3	PHENOL	LESS THAN	.6
4	2,4-DIMETHYLPHENOL	LESS THAN	.7
5	2,4-DICHLOROPHENOL	LESS THAN	1.0
6	P-T-BUTYLPHENOL	LESS THAN	.4
7	P-CHLORO-M-CRESOL	LESS THAN	1.0
8	2,4,6-TRICHLOROPHENOL	LESS THAN	1.7
9	PENTACHLOROPHENOL	LESS THAN	8.0
10	4-NITROPHENOL	LESS THAN	8.9

## Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S09 (003)

Compound	Amount (PPB)
Methane,dichloro-	1.7
Methane,trichloro-	0.5
Propane,1,2-dichloro-	0.4
Ethene,tetrachloro-	0.1

# FINAL REPORT

ATTACHMENT NO 1 A  
17 OF 40

MS DATA FILE FRN: 7526

NAME: EL02S12 FV 1  
MISC DATA:

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS  
MISC DATA:

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	1,3-DICHLOROBENZENE	LESS THAN 1.3
2	1,4-DICHLOROBENZENE	LESS THAN .9
3	HEXACHLOROETHANE	LESS THAN 1.7
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN 1.6
5	N-NITROSODIPROPYLAMINE	LESS THAN 1.6
6	NITROBENZENE	LESS THAN .7
7	ISOPHORONE	LESS THAN .4
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN .6
9	1,2-DICHLOROBENZENE	LESS THAN 1.2
10	1,2,4-TRICHLOROBENZENE	LESS THAN 1.0
11	NAPHTHALENE	LESS THAN .3
12	HEXACHLOROBTADIENE	LESS THAN 1.9
13	2-CHLORONAPHTHALENE	LESS THAN .5
14	ACENAPHTHYLENE	LESS THAN .4
15	DIMETHYLPHTHALATE	LESS THAN .5
16	2,6-DINITROTOLUENE	LESS THAN 3.1
17	ACENAPHTHENE	LESS THAN .5
18	2,4-DINITROTOLUENE	LESS THAN 1.9
19	FLUORENE	LESS THAN .5
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN .8
21	DIETHYLPHTHALATE	LESS THAN .5
22	1,2-DIPHENYLHYDRAZINE	LESS THAN 10.1
23	N-NITROSODIPHENYLAMINE	LESS THAN 1.0
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN 2.0
25	HEXACHLOROBENZENE	LESS THAN 1.7
26	1-CHLORONAPHTHALENE	LESS THAN .5
27	PHENANTHRENE/ANTHRACENE	LESS THAN .5
28	FLUORANTHENE	LESS THAN .7
29	PYRENE	LESS THAN 1.2
30	DI-N-BUTYLPHTHALATE	LESS THAN .6
31	BUTYL BENZYLPHTHALATE	LESS THAN 7.4
32	CHRYSENE	LESS THAN 19.2
33	BENZO(A)ANTHRACENE	LESS THAN 19.2
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN 1.5
35	DI-N-OCTYLPHTHALATE	LESS THAN 3.1
36	BENZO(B)FLUORANTHENE	LESS THAN 2.1
37	BENZO(A)PYRENE	LESS THAN 3.9
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN 1.3
39	DIBENZO(A,H)ANTHRACENE	LESS THAN 2.8
40	BENZO(G,H,I)PERYLENE	LESS THAN 12.0
* 41	DIBROMOBIPHENYL (ISTD)	4.3

\* LOW RECOVERY OF DBBP, OUTSIDE QC LIMIT  
MAR 4/3/81

# FINAL REPORT

MS DATA FILE FRN: 7526

NAME: EL02912 FV 1

MISC DATA:

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

ATTACHMENT NO. 1  
15 OF 40

NAME		CONCENTRATION ( UG/L )	
STANDARD D-10 PHENANTHRENE		30.0	
1	2-NITROPHENOL	LESS THAN	3.2
2	2-CHLOROPHENOL	LESS THAN	1.0
3	PHENOL	LESS THAN	1.0
4	2,4-DIMETHYLPHENOL	LESS THAN	1.1
5	2,4-DICHLOROPHENOL	LESS THAN	1.4
6	P-T-BUTYLPHENOL	LESS THAN	.6
7	P-CHLORO-M-CRESOL	LESS THAN	1.6
8	2,4,6-TRICHLOROPHENOL	LESS THAN	2.5
9	PENTACHLOROPHENOL	LESS THAN	12.1
10	4-NITROPHENOL	LESS THAN	13.3



ORGANIC SCAN: DATA SET EDO 582, SAMPLES COLLECTED IN THE VICINITY OF  
THE PENNWALT CORP., NOVEMBER 5, 1980  
=====

CRL SAMPLE NUMBER 81-EL02612

(UNITS ARE UG/L)

COMPOUND  
-----

*ESTIMATED*  
CONCENTRATION  
-----

BROMOFORM

9

UNIDENTIFIED COMPOUND ( SPECTRUM #127)

3.3

FINAL REPORT

ATTACHMENT NO. 1  
17 OF 40

MS DATA FILE FRN: 7528

NAME: ED0582 80-EL02S13 FV 1

MISC DATA:

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	1,3-DICHLOROBENZENE	LESS THAN	1.2
2	1,4-DICHLOROBENZENE	LESS THAN	.8
3	HEXACHLOROETHANE	LESS THAN	1.5
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN	1.4
5	N-NITROSODIPROPYLAMINE	LESS THAN	1.4
6	NITROBENZENE	LESS THAN	.7
7	ISOPHORONE	LESS THAN	.4
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN	.6
9	1,2-DICHLOROBENZENE	LESS THAN	1.0
10	1,2,4-TRICHLOROBENZENE	LESS THAN	.9
11	NAPHTHALENE	LESS THAN	.3
12	HEXACHLOROBUTADIENE	LESS THAN	1.7
13	2-CHLORONAPHTHALENE	LESS THAN	.5
14	ACENAPHTHYLENE	LESS THAN	.3
15	DIMETHYLPHTHALATE	LESS THAN	.5
16	2,6-DINITROTOLUENE	LESS THAN	2.8
17	ACENAPHTHENE	LESS THAN	.4
18	2,4-DINITROTOLUENE	LESS THAN	1.7
19	FLUORENE	LESS THAN	.5
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN	.7
21	DIETHYLPHTHALATE	LESS THAN	.5
22	1,2-DIPHENYLHYDRAZINE	LESS THAN	9.2
23	N-NITROSODIPHENYLAMINE	LESS THAN	.9
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN	1.8
25	HEXACHLOROBENZENE	LESS THAN	1.6
26	1-CHLORONAPHTHALENE	LESS THAN	.5
27	PHENANTHRENE/ANTHRACENE	LESS THAN	.5
28	FLUORANTHENE	LESS THAN	.6
29	PYRENE	LESS THAN	1.1
30	DI-N-BUTYLPHTHALATE	LESS THAN	.6
31	BUTYL BENZYLPHTHALATE	LESS THAN	6.7
32	CHRYSENE	LESS THAN	17.4
33	BENZO(A)ANTHRACENE	LESS THAN	17.4
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN	1.3
35	DI-N-OCTYLPHTHALATE	LESS THAN	2.9
36	BENZO(B)FLUOANTHENE	LESS THAN	1.9
37	BENZO(A)PYRENE	LESS THAN	3.5
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN	1.2
39	DIBENZO(A,H)ANTHRACENE.	LESS THAN	2.6
40	BENZO(G,H,I)PERYLENE	LESS THAN	10.9
41	DIBROMOBIPHENYL (ISTD)	28.1	

# FINAL REPORT

ATTACHMENT NO. 1  
18 OF 40

MS DATA FILE FRN: 7528

NAME: ED0582 80-EL02S13 FV 1

MISC DATA:

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	2-NITROPHENOL	LESS THAN	2.9
2	2-CHLOROPHENOL	LESS THAN	.9
3	PHENOL	LESS THAN	.9
4	2,4-DIMETHYLPHENOL	LESS THAN	1.0
5	2,4-DICHLOROPHENOL	LESS THAN	1.3
6	P-T-BUTYLPHENOL	LESS THAN	3.0
7	P-CHLORO-M-CRESOL	LESS THAN	1.4
8	2,4,6-TRICHLOROPHENOL	LESS THAN	2.3
9	PENTACHLOROPHENOL	LESS THAN	10.9
10	4-NITROPHENOL	LESS THAN	12.0

ORGANIC SCAN: DATA SET EDO 582, SAMPLES COLLECTED IN THE VICINITY OF  
THE PENNWALT CORP., NOVEMBER 5, 1980  
=====

ATTACHMENT NO. 1A

19 DE 40

CRL SAMPLE NUMBER 81-EL02313

(UNITS ARE UG/L)

COMPOUND  
-----

ESTIMATED  
CONCENTRATION  
-----

2-(1-ETHYLPROPYL)PHENOL

80

2,4,5-TRIPROPYL-3-METHYLPHENOL

5.7

BENZO(B)FLUORANTHENE/BENZO(A)PYRENE

37

MINIMUM DETECTION LEVEL

1.9

ATTACHMENT NO 1  
20 DE 40

Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02s14 (006)

Compound	Amount (PPB)
Methane, dichloro-	1.4
Methane, trichloro-	1.4
Propane, 1,2-dichloro-	2.1

Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S15 (006)

Compound	Amount (PPB)
Methane,dichloro-	1.5
Propane,1,2-dichloro-	1.4
Ethene,tetrachloro-	0.4

# FINAL REPORT

1. A-1 ENI NOLA  
22 DE 40

MS DATA FILE FRN: 7527

NAME: EL02S22 EDO 582 FV 1

MISC DATA:

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

		NAME	CONCENTRATION ( UG/L )
STANDARD	D-10	PHENANTHRENE	30.0
1		1,3-DICHLOROBENZENE	LESS THAN 1.4
2		1,4-DICHLOROBENZENE	LESS THAN 1.0
3		HEXACHLOROETHANE	LESS THAN 1.8
4		BIS(2-CHLOROETHYL)ETHER	LESS THAN 1.7
5		N-NITROSODIPROPYLAMINE	LESS THAN 1.9
6		NITROBENZENE	LESS THAN .8
7		ISOPHORONE	LESS THAN .5
8		BIS(2-CHLOROETHOXY)METHANE	LESS THAN .7
9		1,2-DICHLOROBENZENE	LESS THAN 1.2
10		1,2,4-TRICHLOROBENZENE	LESS THAN 1.0
11		NAPHTHALENE	LESS THAN .3
12		HEXACHLOROBUTADIENE	LESS THAN 2.0
13		2-CHLORONAPHTHALENE	LESS THAN .6
14		ACENAPHTHYLENE	LESS THAN .4
15		DIMETHYLPHTHALATE	LESS THAN .6
16		2,6-DINITROTOLUENE	LESS THAN 3.3
17		ACENAPHTHENE	LESS THAN .5
18		2,4-DINITROTOLUENE	LESS THAN 2.0
19		FLUORENE	LESS THAN .6
20		4-CHLOROPHENYLPHENYL ETHER	LESS THAN .8
21		DIETHYLPHTHALATE	LESS THAN 2.0
22		1,2-DIPHENYLHYDRAZINE	LESS THAN 10.7
23		N-NITROSODIPHENYLAMINE	LESS THAN 1.0
24		4-BROMOPHENYLPHENYL ETHER	LESS THAN 2.1
25		HEXACHLOROBENZENE	LESS THAN 1.8
26		1-CHLORONAPHTHALENE	LESS THAN .6
27		PHENANTHRENE/ANTHRACENE	LESS THAN .6
28		FLUORANTHENE	LESS THAN .7
29		PYRENE	LESS THAN 1.2
30		DI-N-BUTYLPHTHALATE	LESS THAN .7
31		BUTYL BENZYLPHTHALATE	LESS THAN 62.4
32		CHRYSENE	LESS THAN 20.4
33		BENZO(A)ANTHRACENE	LESS THAN 20.4
34		BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN 1.6
35		DI-N-OCTYLPHTHALATE	LESS THAN 3.3
36		BENZO(B)FLUORANTHENE	LESS THAN 2.2
37		BENZO(A)PYRENE	LESS THAN 4.1
38		INDENO(1,2,3-C,D)PYRENE	LESS THAN 1.4
39		DIBENZO(A,H)ANTHRACENE	LESS THAN 3.0
40		BENZO(G,H,I)PERYLENE	LESS THAN 12.8
41		DIBROMOBIPHENYL (ISTD)	30.4

FINAL REPORT

ATTACHMENT NO 1  
23 OF 40

MS DATA FILE FRN: 7527

NAME: EL02S22 EDO 582 FV 1  
MISC DATA:

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS  
MISC DATA:

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	2-NITROPHENOL	LESS THAN 3.4
2	2-CHLOROPHENOL	LESS THAN 1.1
3	PHENOL	LESS THAN 1.0
4	2,4-DIMETHYLPHENOL	LESS THAN 1.2
5	2,4-DICHLOROPHENOL	LESS THAN 1.5
6	P-T-BUTYLPHENOL	LESS THAN .7
7	P-CHLORO-M-CRESOL	LESS THAN 1.6
8	2,4,6-TRICHLOROPHENOL	LESS THAN 2.7
9	PENTACHLOROPHENOL	LESS THAN 12.8
10	4-NITROPHENOL	LESS THAN 14.1



24 Q5 40

ORGANIC SCAN: DATA SET EDO 582, SAMPLES COLLECTED IN THE VICINITY OF  
THE PENNWALT CORP., NOVEMBER 5, 1980  
=====

CRL SAMPLE NUMBER 81-EL02922

(UNITS ARE UG/L)

COMPOUND -----	ESTIMATED CONCENTRATION -----
N,N-ETHYLMETHYL-1-METHOXY-1-BUTANAMINE	910
4-(1-ETHYLPROPYL)PHENOL	600
2-(1-ETHYLPROPYL)PHENOL	3100
2,4,6-TRIPROPYL PHENOL	1500
4-(1,1,3,3-TETRAMETHYLBUTYL)PHENOL	48
2,4,5-TRIPROPYL-3-METHYLPHENOL	1900
MINIMUM DETECTION LEVEL	10

## Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S22 (Infl. Pond #2)

Compound	Amount (PPB)
Propane, 1,2-dichloro-	2.2
Benzene	1.3
Benzene, methyl-	1.8
*2-Butene	2.1
*Butane, 2-methyl-	3.1
*2-Pentene or Dimethylcyclopropane	750
*2-Pentene or Dimethylcyclopropane	12
*2-Pentene or Dimethylcyclopropane	620
*Pentene, methyl (4 isomers)	26
*1,4-Hexadiene	4.5
*2-Butene, 2-chloro-3-methyl-	2.0
*Cycloheptane, bromo-	4.9
*Unknown 1	85
*Unknown 2	2.6

\* See footnote in 81-EL02R33

## FINAL REPORT

ATTACHMENT NO 1A

24 OF 40

MS DATA FILE FRN: 7543

NAME: EDO 582 EL02528 FV 1

MISC DATA: 2-12-81

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	1,3-DICHLOROBENZENE	LESS THAN	1.3
2	1,4-DICHLOROBENZENE	LESS THAN	1.1
3	HEXACHLOROETHANE	LESS THAN	1.8
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN	1.5
5	N-NITROSODIPROPYLAMINE	LESS THAN	1.6
6	NITROBENZENE	LESS THAN	.9
7	ISOPHORONE	LESS THAN	.4
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN	.6
9	1,2-DICHLOROBENZENE	LESS THAN	1.1
10	1,2,4-TRICHLOROBENZENE	LESS THAN	.8
11	NAPHTHALENE	LESS THAN	.3
12	HEXACHLOROBUTADIENE	LESS THAN	1.6
13	2-CHLORONAPHTHALENE	LESS THAN	.4
14	ACENAPHTHYLENE	LESS THAN	.3
15	DIMETHYLPHTHALATE	LESS THAN	.4
16	2,6-DINITROTOLUENE	LESS THAN	3.1
17	ACENAPHTHENE	LESS THAN	.4
18	2,4-DINITROTOLUENE	LESS THAN	1.9
19	FLUORENE	LESS THAN	.5
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN	.8
21	DIETHYLPHTHALATE	LESS THAN	.4
22	1,2-DIPHENYLHYDRAZINE	LESS THAN	10.0
23	N-NITROSODIPHENYLAMINE	LESS THAN	.8
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN	1.8
25	HEXACHLOROBENZENE	LESS THAN	1.2
26	1-CHLORONAPHTHALENE	LESS THAN	.4
27	PHENANTHRENE/ANTHRACENE	LESS THAN	.5
28	FLUORANTHENE	LESS THAN	.7
29	PYRENE	LESS THAN	1.1
30	DI-N-BUTYLPHTHALATE	LESS THAN	.6
31	BUTYL BENZYLPHTHALATE	LESS THAN	7.3
32	CHRYSENE	LESS THAN	19.1
33	BENZO(A)ANTHRACENE	LESS THAN	19.1
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN	1.5
35	DI-N-OCTYLPHTHALATE	LESS THAN	3.1
36	BENZO(B)FLUORANTHENE	LESS THAN	2.1
37	BENZO(A)PYRENE	LESS THAN	3.9
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN	1.3
39	DIBENZO(A,H)ANTHRACENE	LESS THAN	2.8
40	BENZO(G,H,I)PERYLENE	LESS THAN	11.9
41	DIBROMOBIPHENYL (ISTD)		18.0

FINAL REPORT

MS DATA FILE FRN: 7543

ATTACHMENT NO1A

27 OF 40

NAME: EDQ 582 EL02S28 FV 1

MISC DATA: 2-12-81

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	2-NITROPHENOL	LESS THAN 3.2
2	2-CHLOROPHENOL	LESS THAN 1.0
3	PHENOL	LESS THAN 1.0
4	2,4-DIMETHYLPHENOL	LESS THAN 1.1
5	2,4-DICHLOROPHENOL	LESS THAN 1.4
6	P-T-BUTYLPHENOL	LESS THAN .6
7	P-CHLORO-M-CRESOL	LESS THAN 1.5
8	2,4,6-TRICHLOROPHENOL	LESS THAN 2.5
9	PENTACHLOROPHENOL	LESS THAN 11.9
10	4-NITROPHENOL	LESS THAN 13.1

ORGANIC SCAN: DATA SET EDO 582, SAMPLES COLLECTED IN THE VICINITY OF  
PENNMALT CORP., NOVEMBER 5, 1980

=====

ATTACHMENT NO1.A

28 OF 40

CRL SAMPLE NUMBER 81-EL02S28

(UNITS ARE UG/L)

COMPOUND

ESTIMATED  
CONCENTRATION

2-(1-ETHYLPROPYL) PHENOL	2.2
2,4,5-TRIPROPYL-3-METHYLPHENOL	3.5
DI-1-(4,5,6,7-TETRAHYDROINDOLE) METHANONE	5
UNIDENTIFIED COMPOUND (SPECTRUM # 282)	3.7
MINIMUM DETECTION LEVEL	.9

Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S28 (Influ. Pond #1 Thioureas)

Compound	Amount (PPB)
Methane, trichloro-	0.9
Propane, 1,2-dichloro-	2.3
Ethene, tetrachloro-	1.6
*Dimethylhexene	88
*Dimethylhexane	140

Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02S30 (Influ. Pond #4)

Compound	Amount (PPB)
Methane, trichloro-	8.7
Propane, 1,2-dichloro-	2.4
Ethene, trichloro-	0.1
Ethene, tetrachloro-	0.1
*Butene, methyl-	4.9

\* See footnote in 81-EL02R33

## FINAL REPORT

ATTACHMENT NO. 1A

31 OF 40

MS DATA FILE FRN: 7544

NAME: EDO 582 EL02931 FV 1

MISC DATA: 2-12-81

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( UG/L )	
STANDARD	D-10 PHENANTHRENE	30.0	
1	1,3-DICHLOROBENZENE	LESS THAN	1.4
2	1,4-DICHLOROBENZENE	LESS THAN	1.2
3	HEXACHLOROETHANE	LESS THAN	2.0
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN	1.6
5	N-NITROSODIPROPYLAMINE	LESS THAN	1.7
6	NITROBENZENE	LESS THAN	.9
7	ISOPHORONE	LESS THAN	.5
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN	.7
9	1,2-DICHLOROBENZENE	LESS THAN	1.2
10	1,2,4-TRICHLOROBENZENE	LESS THAN	.8
11	NAPHTHALENE	LESS THAN	.3
12	HEXACHLOROBUTADIENE	LESS THAN	1.7
13	2-CHLORONAPHTHALENE	LESS THAN	.4
14	ACENAPHTHYLENE	LESS THAN	.3
15	DIMETHYLPHTHALATE	LESS THAN	.4
16	2,6-DINITROTOLUENE	LESS THAN	3.3
17	ACENAPHTHENE	LESS THAN	.5
18	2,4-DINITROTOLUENE	LESS THAN	2.0
19	FLUORENE	LESS THAN	.5
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN	.8
21	DIETHYLPHTHALATE	LESS THAN	.5
22	1,2-DIPHENYLHYDRAZINE	LESS THAN	10.8
23	N-NITROSODIPHENYLAMINE	LESS THAN	.9
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN	2.0
25	HEXACHLOROBENZENE	LESS THAN	1.3
26	1-CHLORONAPHTHALENE	LESS THAN	.4
27	PHENANTHRENE/ANTHRACENE	LESS THAN	.5
28	FLUORANTHENE	LESS THAN	.7
29	PYRENE	LESS THAN	1.1
30	DI-N-BUTYLPHTHALATE	LESS THAN	.6
31	BUTYL BENZYLPHTHALATE	LESS THAN	7.9
32	CHRYSENE	LESS THAN	20.5
33	BENZO(A)ANTHRACENE	LESS THAN	20.5
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN	1.6
35	DI-N-OCTYLPHTHALATE	LESS THAN	3.4
36	BENZO(B)FLUORANTHENE	LESS THAN	2.2
37	BENZO(A)PYRENE	LESS THAN	4.1
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN	1.4
39	DIBENZO(A,H)ANTHRACENE	LESS THAN	3.0
40	BENZO(G,H,I)PERYLENE	LESS THAN	12.8
41	DIBROMOBIPHENYL (ISTD)	24.3	



FINAL REPORT

MS DATA FILE FRN: 7544

NAME: EDO 582 EL02S31 FV 1

MISC DATA: 2-12-81

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

ATTACHMENT NO1A  
32 OF 40

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	2-NITROPHENOL	LESS THAN 3.4
2	2-CHLOROPHENOL	LESS THAN 1.1
3	PHENOL	LESS THAN 1.0
4	2,4-DIMETHYLPHENOL	LESS THAN 1.2
5	2,4-DICHLOROPHENOL	LESS THAN 1.5
6	P-T-BUTYLPHENOL	LESS THAN 5.4
7	P-CHLORO-M-CRESOL	LESS THAN 1.7
8	2,4,6-TRICHLOROPHENOL	LESS THAN 2.7
9	PENTACHLOROPHENOL	LESS THAN 12.8
10	4-NITROPHENOL	LESS THAN 14.1

ORGANIC SCAN: DATA SET EDO 582, SAMPLES COLLECTED IN THE VICINITY OF  
THE PENNWALT CORP., NOVEMBER 5, 1980  
=====

ATTACHMENT NO1A

37 OF 40

CRL SAMPLE NUMBER 81-EL02931

(UNITS ARE UG/L)

COMPOUND -----	ESTIMATED CONCENTRATION -----
N,N-DIPENTYL-1-PENTANAMINE	280
3-METHYL-N,N-BIS(3-METHYLBUTYL)-1-BUTANAMINE (2 ISOMERS)	1400
2-(1-ETHYLPROPYL)PHENOL	180
2,4,5-TRIPROPYL-3-METHYLPHENOL	10
MINIMUM DETECTION LEVEL	5.4

Purgeable Fraction

ATTACHMENT NO 1A

34 OF 40

Sample: EDO-582 (Pennwalt): 81-EL02S31 (Influ. Pond #4)

Compound	Amount (PPB)
Methane, trichloro-	0.5
Propane, 1,2-dichloro-	1.6
Ethene, trichloro-	0.1
Ethene, tetrachloro-	0.4
*Butene, methyl	5.6

\* See footnote in 81-EL02R33

# FINAL REPORT

MS DATA FILE FRN: 7550

ATTACHMENT NO1A

35 OF 40

NAME: EL02832 FV 100

MISC DATA: 2-13-81

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

NAME		CONCENTRATION ( MG/KG )	
STANDARD	D-10 PHENANTHRENE	150.0	
1	1,3-DICHLOROBENZENE	LESS THAN	6.3
2	1,4-DICHLOROBENZENE	LESS THAN	4.2
3	HEXACHLOROETHANE	LESS THAN	7.8
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN	7.4
5	N-NITROSODIPROPYLAMINE	LESS THAN	7.2
6	NITROBENZENE	LESS THAN	3.5
7	ISOPHORONE	LESS THAN	2.0
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN	2.9
9	1,2-DICHLOROBENZENE	LESS THAN	5.4
10	1,2,4-TRICHLOROBENZENE	LESS THAN	4.5
11	NAPHTHALENE	LESS THAN	1.3
12	HEXACHLOROBUTADIENE	LESS THAN	8.8
13	2-CHLORONAPHTHALENE	LESS THAN	2.5
14	ACENAPHTHYLENE	LESS THAN	1.7
15	DIMETHYLPHTHALATE	LESS THAN	2.4
16	2,6-DINITROTOLUENE	LESS THAN	14.3
17	ACENAPHTHENE	LESS THAN	2.2
18	2,4-DINITROTOLUENE	LESS THAN	8.6
19	FLUORENE	LESS THAN	2.5
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN	3.6
21	DIETHYLPHTHALATE	LESS THAN	2.5
22	1,2-DIPHENYLHYDRAZINE	LESS THAN	46.9
23	N-NITROSODIPHENYLAMINE	LESS THAN	4.6
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN	9.1
25	HEXACHLOROBENZENE	LESS THAN	8.0
26	1-CHLORONAPHTHALENE	LESS THAN	2.5
27	PHENANTHRENE/ANTHRACENE	LESS THAN	2.5
28	FLUORANTHENE	21.4	
29	PYRENE	12.7	
30	DI-N-BUTYLPHTHALATE	LESS THAN	3.0
31	BUTYL BENZYLPHTHALATE	LESS THAN	34.3
32	CHRYSENE	LESS THAN	89.1
33	BENZO(A)ANTHRACENE	LESS THAN	89.1
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN	6.9
35	DI-N-OCTYLPHTHALATE	LESS THAN	14.6
36	BENZO(B)FLUORANTHENE	LESS THAN	9.7
37	BENZO(A)PYRENE	LESS THAN	18.0
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN	6.2
39	DIBENZO(A,H)ANTHRACENE	LESS THAN	13.1
40	BENZO(G,H,I)PERYLENE	LESS THAN	55.7
41	DIBROMOBIPHENYL (ISTD)	LESS THAN	17.5

# FINAL REPORT

MS DATA FILE FRN: 7550

NAME: EL02882 FV 100  
MISC DATA: 2-13-81

ATTACHMENT NO. 1A

*JE 40*

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS  
MISC DATA:

NAME		CONCENTRATION ( MG/KG )	
STANDARD	D-10 PHENANTHRENE	150.0	
1	2-NITROPHENOL	LESS THAN	14.7
2	2-CHLOROPHENOL	LESS THAN	4.7
3	PHENOL	LESS THAN	4.4
4	2,4-DIMETHYLPHENOL	LESS THAN	5.1
5	2,4-DICHLOROPHENOL	LESS THAN	6.6
6	P-T-BUTYLPHENOL	LESS THAN	3.0
7	P-CHLORO-M-CRESOL	LESS THAN	7.2
8	2,4,6-TRICHLOROPHENOL	LESS THAN	11.7
9	PENTACHLOROPHENOL	LESS THAN	55.7
10	4-NITROPHENOL	LESS THAN	61.4

ORGANIC SCAN: DATA SET EDO 582, SAMPLES COLLECTED IN THE VICINITY OF  
THE PENNVALT CORP., NOVEMBER 5, 1980  
=====

ATTACHMENT NO1A

37 OF 40

CRL SAMPLE NUMBER 81-EL02932

(UNITS ARE MG/KG)

COMPOUND

ESTIMATED  
CONCENTRATION

2,4,5-TRIPROPYL-3-METHYLPHENOL

42

MINIMUM DETECTION LEVEL

14

## FINAL REPORT

ATTACHMENT NO. 1A

38 OE 40

MS DATA FILE FRN: 7533

NAME: EL02R33 FV 1

MISC DATA: 2-11-81

IDFILE FRN: 4604

IDFILE NAME: BASE NEUTRAL ANALYSIS

MISC DATA:

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	1,3-DICHLOROBENZENE	LESS THAN 3.9
2	1,4-DICHLOROBENZENE	LESS THAN 2.6
3	HEXACHLOROETHANE	LESS THAN 4.9
4	BIS(2-CHLOROETHYL)ETHER	LESS THAN 4.6
5	N-NITROSODIPROPYLAMINE	LESS THAN 4.5
6	NITROBENZENE	LESS THAN 2.2
7	ISOPHORONE	LESS THAN 1.3
8	BIS(2-CHLOROETHOXY)METHANE	LESS THAN 1.8
9	1,2-DICHLOROBENZENE	LESS THAN 3.3
10	1,2,4-TRICHLOROBENZENE	LESS THAN 2.8
11	NAPHTHALENE	LESS THAN .8
12	HEXACHLOROBUTADIENE	LESS THAN 5.5
13	2-CHLORONAPHTHALENE	LESS THAN 1.6
14	ACENAPHTHYLENE	LESS THAN 1.0
15	DIMETHYLPHTHALATE	LESS THAN 1.5
16	2,6-DINITROTOLUENE	LESS THAN 8.9
17	ACENAPHTHENE	LESS THAN 1.4
18	2,4-DINITROTOLUENE	LESS THAN 5.4
19	FLUORENE	LESS THAN 1.5
20	4-CHLOROPHENYLPHENYL ETHER	LESS THAN 2.3
21	DIETHYLPHTHALATE	LESS THAN 1.5
22	1,2-DIPHENYLHYDRAZINE	LESS THAN 29.2
23	N-NITROSODIPHENYLAMINE	LESS THAN 2.8
24	4-BROMOPHENYLPHENYL ETHER	LESS THAN 5.7
25	HEXACHLOROBENZENE	LESS THAN 4.9
26	1-CHLORONAPHTHALENE	LESS THAN 1.6
27	PHENANTHRENE/ANTHRACENE	LESS THAN 1.6
28	FLUORANTHENE	LESS THAN 1.9
29	PYRENE	LESS THAN 3.4
30	DI-N-BUTYLPHTHALATE	LESS THAN 1.8
31	BUTYL BENZYLPHTHALATE	LESS THAN 21.3
32	CHRYSENE	LESS THAN 55.4
33	BENZO(A)ANTHRACENE	LESS THAN 55.4
34	BIS(2-ETHYLHEXYL)PHTHALATE	LESS THAN 4.3
35	DI-N-OCTYLPHTHALATE	LESS THAN 9.1
36	BENZO(B)FLUORANTHENE	LESS THAN 6.0
37	BENZO(A)PYRENE	LESS THAN 11.2
38	INDENO(1,2,3-C,D)PYRENE	LESS THAN 3.9
39	DIBENZO(A,H)ANTHRACENE	LESS THAN 8.1
40	BENZO(G,H,I)PERYLENE	LESS THAN 34.6
41	DIBROMOBIPHENYL (ISTD)	35.5

## FINAL REPORT

ATTACHMENT JN01.A

39 QF 40

MS DATA FILE FRN: 7533

NAME: ELQ2P33 FV 1

MISC DATA: 2-11-81

IDFILE FRN: 4601

IDFILE NAME: ACID ANALYSIS

MISC DATA:

	NAME	CONCENTRATION ( UG/L )
STANDARD	D-10 PHENANTHRENE	30.0
1	2-NITROPHENOL	LESS THAN 9.2
2	2-CHLOROPHENOL	LESS THAN 2.9
3	PHENOL	LESS THAN 2.8
4	2,4-DIMETHYLPHENOL	LESS THAN 3.2
5	2,4-DICHLOROPHENOL	LESS THAN 4.1
6	P-T-BUTYLPHENOL	LESS THAN 1.8
7	P-CHLORO-M-CRESOL	LESS THAN 4.5
8	2,4,6-TRICHLOROPHENOL	LESS THAN 7.3
9	PENTACHLOROPHENOL	LESS THAN 34.6
10	4-NITROPHENOL	LESS THAN 38.2



Purgeable Fraction

Sample: EDO-582 (Pennwalt): 81-EL02R33 (blank)

Compound	Amount (PPB)
Methane,dichloro-	2.3
Methane,trichloro-	1.3
Ethane,1,2-dichloro-	10
*Butene, methyl	1.7

\* Identified by mass spectrum only. Authentic compound was not analyzed and compared. Response factor was assumed to be identical to that of the internal standard used.

## PUBLIC NOTICE

Date: July 7, 1988  
 Permit No. M10002381  
 Pennwalt Corp

The Michigan Water Resources Commission proposes to reissue a discharge permit to: the Pennwalt Corporation, Wyandotte Plant, 4655 Biddle Avenue, Wyandotte, Michigan 48192-7397. The applicant produces organic and inorganic chemical products. The applicant proposes to discharge treated wastewater from organic process operations, inorganic process operations, boiler blowdown, noncontact cooling water, and stormwater runoff to the Detroit River Trenton Channel via Monguagon Creek in Section 5, T4S, R11E, Wayne County.

The draft permit includes the following modifications to the previously issued permit: Effluent limits are being revised to include interim and promulgated federal regulations for organic chemical manufacture (40 CFR Parts 414 and 416) and results of sampling studies.

Comments or objections to the draft permit received by August 8, 1988, will be considered in the final decision to issue the permit. Persons desiring information regarding the draft permit, procedures for commenting, or requesting a hearing, should contact: Ms. Diane M. Carlson, P.E., Permits Section, Surface Water Quality Division, Department of Natural Resources, P.O. Box 30028, Lansing, Michigan, 48909, Telephone: 517-373-8088.

Copies of the public notice, fact sheet, and draft permit may be obtained at the Surface Water Quality Division District Office located at 505 West Main Street, Northville, Michigan 48167, Telephone: 313-334-9460.

## FACT SHEET

PERMITTEE/FACILITY NAME: Pennwalt Corporation  
 Wyandotte, Michigan

COUNTY: Wayne

DESCRIPTION OF EXISTING WASTEWATER TREATMENT FACILITIES: The applicant manufactures organic and inorganic chemicals. Scrubbers, steam strippers, and absorption processes are used to remove organic contaminants from air and wastewater discharges prior to recycle or contract disposal. Wastes and wastewaters are segregated from process sources to minimize quantities to be hauled or treated. Storm water from process areas is included in many process wastewaters. End-of-pipe treatment consists of pH control, equalization, sedimentation, and oil skimming of combined process, noncontact cooling, and stormwater runoff wastewaters prior to discharge to the Detroit River Trenton Channel via Monguagon Creek.

MAP OF DISCHARGE LOCATION: (see attached)

RECEIVING WATER:

The Detroit River is protected for agricultural uses, navigation, industrial water supply, public water supply at the point of water intake, cold-water fish, other indigenous aquatic life and wildlife, partial body contact recreation, and total body contact recreation (May through October). Receiving stream flow used to develop effluent limitations: 32,500 cfs (Trenton Channel)

MIXING ZONE:

For toxic pollutants, the volume of receiving water used in assuring that effluent limitations are sufficiently stringent to meet Water Quality Standards is 25% of the design flow of the receiving stream.

For other pollutants, the volume of receiving water used in assuring that effluent limitations are sufficiently stringent to meet Water Quality Standards is the design flow of the receiving stream.

INTAKE QUALITY: (from MOR dated 1985)

	<u>MONTHLY AVG</u>	<u>DAILY MAX</u>
Total Suspended Solids	21	42 mg/l
Biochemical Oxygen Demand	3	4
Chlorides	42	295

EXISTING EFFLUENT QUALITY: (from application dated March 31, 1987)

Outfall 001 (formerly outfall 006)	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM
	in mg/l		in pounds/day	
Flow (MGD)		11.6		
Biochemical Oxygen Demand-5 day	18	56	1733	5392
Chemical Oxygen Demand	50	572		
Ammonia, as nitrogen	1.15	15		
Total Suspended Solids	8.0	17	770	3562
Oil and Grease		1.8		
Total Organic Carbon		93		
Total Residual Chlorine	0.005	0.020		
Total Phosphorus		0.091		
Total Zinc	0.025	0.14	2.4	134.8
Phenol	0.051	2.125	4.9	204
Chlorides	40	95		
Temperature (°F) winter	53	61		
summer	85	91		
	<u>MINIMUM</u>	<u>MAXIMUM</u>		
Dissolved Oxygen		9.7		
pH	6.8	10.5		

PROPOSED EFFLUENT LIMITATIONS: (see attached pages from draft permit)

BASIS FOR PROPOSED EFFLUENT LIMITATIONS:

Based on this facility's application for NPDES discharge permit, the Michigan Water Resources Commission proposes to issue the applicant a permit to discharge, subject to interim and final effluent limitations and certain other conditions within the permit.

Interim limits for total suspended solids and monthly average BOD<sub>5</sub> are based on Best Professional Judgement using OCPSF regulations proposed in 1985. The total suspended solids limit includes a correction for high intake TSS. The interim phenol limit is based on current permit limits. Daily maximum BOD<sub>5</sub> is based on promulgated OCPSF regulations.

Final effluent limitations for total suspended solids, biochemical oxygen demand, and total phenol are based on promulgated OCPSF regulations and Best Professional Judgement limits for unregulated wastewater. The total zinc limit is based on aquatic toxicity. The limit for total residual chlorine is water quality based.

ADDITIONAL INFORMATION:

New Regulations for the Organic Chemical, Plastic, and Synthetic Fibers Industry were promulgated on November 5, 1987. Limits for Best Practicable Technology (BPT) and Best Available Technology (BAT) were published based on updated treatment and process information. Biannual monitoring is recommended for toxic (BAT) pollutants. Short term monitoring is recommended for heavy metals, alkylamines, alkanolamines, cyanide, and PCB's to determine the presence, if any, in the discharge. Limits will be developed, if appropriate.

REGISTER OF INTERESTED PERSONS

Any person interested in a particular application or group of applications, may leave his name, address, and telephone number as part of the file for an application. The list of names will be maintained as a means for persons with an interest in an application to contact others with similar interests.

PUBLIC COMMENT

Comments or objections to the draft permit received between 7/7/88 and 8/8/88 will be considered in the final decision to issue the permit.

If submitted comments indicate significant public interest in the application or if useful information may be produced, the Michigan Water Resources Commission at its discretion, may hold a public hearing on the application. Any person may request the Michigan Water Resources Commission to hold a public hearing on the application. The request should include specific reasons for the request, indicating which portions of the application or draft permit constitutes the need for a hearing.

Public notice of a hearing will be provided at least thirty (30) days in advance. The hearing will normally be held in the vicinity of the discharge. The Michigan Water Resources Commission will consider comments made at the hearing when making its final determinations on the permit. Further information regarding the draft permit, and procedures for commenting or requesting a public hearing may be obtained by contacting Ms. Diane M. Carlson, P.E., Permits Section, Surface Water Quality Division, Department of Natural Resources, P.O. Box 30028, Lansing, Michigan, 48909. Telephone 517-373-8088.

## Part I

**DRAFT PERMIT**

## Section A.

d. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids or deposits) shall be reported immediately to the Detroit District Office of the Surface Water Quality Division followed with a written report within 5 days detailing the findings of the investigation and the steps taken to correct the condition.

e. In the event the permittee shall require the discharge of water treatment additives, the permittee shall notify the Chief of the Surface Water Quality Division. The permittee shall obtain written approval from the Chief of the Surface Water Quality Division to discharge such additives at a specified level. The permit may be modified in accordance with the requirements of Part 11.B.4 if a constituent of the additive or additives requires limiting.

f. The term noncontact cooling water shall mean water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product, or finished product.

g. The above limitations for total suspended solids may be modified to a Net value upon demonstration to the Chief of the Surface Water Quality Division that gross values are unattainable. The permittee shall make a net demonstration according to 40 CFR, Part 122.

MICHIGAN WATER RESOURCES COMMISSION  
AUTHORIZATION TO DISCHARGE UNDER THE  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Act"), and the Michigan Water Resources Commission Act, as amended, (Act 245, Public Acts of 1929, as amended, the "Michigan Act"),

Pennwalt Corporation

is authorized to discharge from a facility located at

4655 Biddle Avenue  
Wyandotte, Michigan 48912

designated as Pennwalt Corp

to the receiving water named the Detroit River Trenton Channel in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I and II hereof.

This permit takes effect immediately upon the date of issuance. Any person who feels aggrieved by this permit may file a sworn petition with the Commission, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Commission may reject any petition filed more than 60 days after issuance as being untimely. Upon granting of a contested case to the applicant, the Commission shall review the permit to determine which contested term shall be stayed until the Commission takes its final action. All other conditions of the permit remain in full effect. If the contested condition is a modification of a previous permit condition and the Commission determines the contested condition shall be stayed, then such previous condition remains in effect until the Commission takes final action. During the course of any administrative proceeding brought by a person other than the applicant, the conditions of this permit will remain in effect, unless the Commission determines otherwise.

This permit and the authorization to discharge shall expire at midnight October 1, 1992. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and forms as are required by the Michigan Water Resources Commission no later than 180 days prior to the date of expiration.

This permit is based on an application dated March 31, 1987, as amended, and referencing information submitted with prior applications, and shall supersede any and all Orders of Determination, Stipulation, Final Orders of Determination, or NPDES permits previously adopted by the Michigan Water Resources Commission.

Issued this       th day of       , 1988, by the Michigan Water Resources Commission, superseding NPDES Permit No. M10002381, expiring October 1, 1987.

DRAFT PERMIT  
JUL 7, 1988  
Paul D. Zuger  
Executive Secretary

## PART I

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

## 1. Interim Effluent Limitations

Beginning on the date of permit issuance and lasting until March 31, 1989, the permittee is authorized to discharge a maximum of fourteen million seven hundred twenty thousand (14,720,000) gallons per day of organic and inorganic process water, barometric condenser cooling water, boiler blowdown, noncontact cooling water, and an unspecified quantity of stormwater runoff from outfall 001 (formerly outfall 006) to the Detroit River Trenton Channel via Monguagon Creek. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Other Limitations		Monitoring Requirements	
	lbs/day				Measurement	Sample
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Frequency	Type
Flow (MGD)					Daily	Report Total Daily Flow
Total Suspended Solids	1716	4536	14 mg/l	37 mg/l	3x Weekly	24-hr Composite
BOD <sub>5</sub>	1457	2773			3x Weekly	24-hr Composite
Total Zinc			105 ug/l	190 ug/l	2x Monthly	24-hr Composite
Total Residual Chlorine				0.036 mg/l	3x Weekly	Grab
Phenol				0.2 mg/l	Weekly	24-hr Composite
Chlorides			Monitor		3x Weekly	24-hr Composite
Outfall Observation					Daily	Visual
Temperature (°F)			Monitor		3x Weekly	Reading
				<u>Minimum</u>		
Dissolved Oxygen				5.0 mg/l	3x Weekly	Grab

a. The receiving stream shall contain no unnatural turbidity, color, oil film, floating solids, foams, settleable solids, or deposits as a result of this discharge.

b. Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to the discharge to Monguagon Creek.

c. The pH shall not be less than 6.5 nor greater than 9.0, except as provided below. The pH shall be monitored as follows: continuous; report minimum and maximum; reading: daily. In addition, the permittee shall report each excursion from the allowable range of 6.5 to 9.0 on an individual occurrence and monthly cumulative basis. The total time during which the pH values are outside the pH values of 6.5 to 9.0 shall be no more than 7 hours and 26 minutes in any calendar month, and no single excursion shall exceed 60 minutes. The discharge shall be within the range of 6.0 to 10.5, 100% of the time.

## PART I

## Section A.

d. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids or deposits) shall be reported immediately to the Detroit District Office of the Surface Water Quality Division followed with a written report within 5 days detailing the findings of the investigation and the steps taken to correct the condition.

e. In the event the permittee shall require the discharge of water treatment additives, the permittee shall notify the Chief of the Surface Water Quality Division. The permittee shall obtain written approval from the Chief of the Surface Water Quality Division to discharge such additives at a specified level. The permit may be modified in accordance with the requirements of Part 11.B.4 if a constituent of the additive or additives requires limiting.

f. The term noncontact cooling water shall mean water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product, or finished product.

## PART I

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

## 2. Final Effluent Limitations

Beginning on March 31, 1989, and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of fourteen million seven hundred twenty thousand (14,720,000) gallons per day of organic and inorganic process water, barometric condenser cooling water, boiler blowdown, noncontact cooling water, and an unspecified quantity of stormwater runoff from outfall 001 (formerly outfall 006) to the Detroit River Trenton Channel via Monguagon Creek. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	<u>Discharge Limitations</u>		<u>Other Limitations</u>		<u>Monitoring Requirements</u>	
	<u>lbs/day</u>				<u>Measurement</u>	<u>Sample</u>
	<u>Monthly</u> <u>Average</u>	<u>Daily</u> <u>Maximum</u>	<u>Monthly</u> <u>Average</u>	<u>Daily</u> <u>Maximum</u>	<u>Frequency</u>	<u>Type</u>
Flow (MGD)					Daily	Report Total Daily Flow
Total Suspended Solids	1568	4525			3x Weekly	24-hr Composite
BOD <sub>5</sub>	1039	2773			3x Weekly	24-hr Composite
Total Zinc	12.9	23.3	105 ug/l	190 ug/l	2x Monthly	24-hr Composite
Total Residual Chlorine				0.036 mg/l	3x Weekly	Grab
Phenol	0.45	1.1	4 ug/l	9 ug/l	Weekly	24-hr Composite
Chlorides			Monitor		3x Weekly	24-hr Composite
Outfall Observation					Daily	Visual
Temperature (°F)			Monitor		3x Weekly	Reading
				<u>Minimum</u>		
Dissolved Oxygen				5.0 mg/l	3x Weekly	Grab

a. The receiving stream shall contain no unnatural turbidity, color, oil film, floating solids, foams, settleable solids, or deposits as a result of this discharge.

b. Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to the discharge to Monguagon Creek.

c. The pH shall not be less than 6.5 nor greater than 9.0, except as provided below. The pH shall be monitored as follows: continuous; report minimum and maximum; reading: daily. In addition, the permittee shall report each excursion from the allowable range of 6.5 to 9.0 on an individual occurrence and monthly cumulative basis. The total time during which the pH values are outside the pH values of 6.5 to 9.0 shall be no more than 7 hours and 26 minutes in any calendar month, and no single excursion shall exceed 60 minutes. The discharge shall be within the range of 6.0 to 10.5, 100% of the time.

## Part I

## Section A.

d. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids or deposits) shall be reported immediately to the Detroit District Office of the Surface Water Quality Division followed with a written report within 5 days detailing the findings of the investigation and the steps taken to correct the condition.

e. In the event the permittee shall require the discharge of water treatment additives, the permittee shall notify the Chief of the Surface Water Quality Division. The permittee shall obtain written approval from the Chief of the Surface Water Quality Division to discharge such additives at a specified level. The permit may be modified in accordance with the requirements of Part II. If a constituent of the additive or additives requires limiting.

f. The term noncontact cooling water shall mean water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product, or finished product.

g. The above limitations for total suspended solids may be modified to a Net value upon demonstration to the Chief of the Surface Water Quality Division that gross values are unattainable. The permittee shall make a net demonstration according to 40 CFR, Part 122.

## PART I

## Section A.

3. Special Condition - Reopener Clause

This permit may be modified or, alternatively, revoked and reissued to comply with any applicable standard(s) or limitation(s) promulgated under Section 301(b)(2)(c)(d), 304(b)(2) and 307(a)(2) of the Act, if the effluent standard(s) or limitation(s) so promulgated:

- a. is(are) either different in condition or more stringent than any effluent limitation in the permit; or
- b. control(s) any pollutant not limited in the permit.

4. Special Condition - Notification Requirement

The discharger shall notify the Chief of the Surface Water Quality Division, in writing, within 10 days of knowing, or having reason to believe, that a change in facility operation, sewerage system users, maintenance, or construction has resulted or will result in the discharge of:

- a. Detectable levels\* of chemicals on the current Michigan Critical Materials Register or priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, which were not acknowledged in the application\*\* or listed in the application at less than detectable levels.
- b. Detectable levels\* of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information.
- c. Any chemical at levels greater than five times the average level reported in the application\*\*.

Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the schedule of compliance.

\*The detectable level shall be defined as the Method Detection Limit (MDL) as given in Appendix B to Part 136, Federal Register, Vol. 49, No. 209, October 26, 1984, pp. 43430-31.

\*\*The application dated March 31, 1987, as amended, and referenced information submitted with prior applications.

## PART I

## Section A.

8. Special Condition - Groundwater Discharge Not Authorized

The reissuance of this permit does not authorize any discharges to the groundwaters. Such discharges must be authorized by a groundwater discharge permit issued pursuant to Act 245, Public Acts of 1929, as amended.

9. Special Condition - Short Term Waste Characterization Study

As a condition of this permit, the permittee shall monitor wastewaters prior to mixing with noncontact cooling water (which is discharged at the end of the final pond) and at outfall 001 for the duration specified below. This monitoring is designed to determine whether these constituents are discharged in significant quantities. The results of the analysis of such monitoring shall be submitted to the Chief of the Surface Water Quality Division in accordance with Part I.C.4., Schedule of Compliance. If, upon review of the analysis, it is determined that any of the materials or constituents require limiting to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified after public notice and Commission approval of the recommended permit modification in accordance with Part II.B.4.

<u>CONSTITUENT</u>	<u>SAMPLE TYPE</u>	<u>SAMPLE FREQUENCY</u>	<u>SAMPLE DURATION</u>
Total Alkylamines	24-hr Comp	Weekly	Eight Weeks
Total Alkanolamines	24-hr Comp	Weekly	Eight Weeks

## PART I

## B. MONITORING AND REPORTING

## 1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

## 2. Reporting:

DMR Submittal Requirements - The permittee shall submit Discharge Monitoring Report (DMR) forms to the Michigan Department of Natural Resources, Surface Water Quality Division, Data Entry Unit, P.O. Box 30028, Lansing, Michigan, 48909, for each calendar month of the authorized discharge period(s). The DMRs shall be postmarked no later than the 10th day of the month following each month of the authorized discharge period.

## 3. Definitions

a. The monthly average discharge is defined as the total discharge by weight, or concentration if specified, during the reporting month divided by the number of days in the reporting month that the discharge from the production or commercial facility occurred. When less than daily sampling occurs, the monthly average discharge shall be determined by the summation of the measured daily discharges by weight, or concentration if specified, divided by the number of days during the reporting month when the samples were collected, analyzed and reported.

b. The daily maximum discharge means the total discharge by weight, or concentration if specified, during any calendar day.

c. The Regional Administrator is defined as the Region V Administrator, U.S. EPA, located at 230 South Dearborn, 13th Floor, Chicago, Illinois, 60604.

d. The Michigan Water Resources Commission is located in the STEVENS T. MASON BUILDING. The mailing address is P.O. Box 30028, Lansing, Michigan, 48909.



## PART I

## Section B.

## 4. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(h) of the Act, under which such procedures may be required.

## 5. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. The exact place, date, and time of sampling;
- b. The dates the analyses were performed;
- c. The person(s) who performed the analyses;
- d. The analytical techniques or methods used; and
- e. The results of all required analyses.

## 6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Monthly Operating Report. Such increased frequency shall also be indicated.

## 7. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Michigan Water Resources Commission.

## PART I

## C. SCHEDULE OF COMPLIANCE

1. The permittee shall continue to operate the installed facilities to achieve the effluent limitations specified for outfall 001.

2. On or before April 1st and October 1st of each year, during the effectiveness of this permit, the permittee shall submit the analytical results required in the BAT Monitoring Section, Part 1.A.4. of this permit. The analytical results shall be submitted to the Chief of the Surface Water Quality Division.

3. The permittee shall achieve compliance with the Short Term Intake-Discharge Study requirements specified in Part 1.A.7., in accordance with the following schedule. All submittals shall be to the Chief of the Surface Water Quality Division.

- a. On or before October 1, 1988, the permittee shall submit and receive approval of a monitoring, sampling, and analysis plan.
- b. On or before February 1, 1989, the permittee shall submit the analytical results of such monitoring.

4. The permittee shall achieve compliance with the Short Term Waste Characterization Study requirements specified in Part 1.A.9., in accordance with the following schedule. All submittals shall be to the Chief of the Surface Water Quality Division.

- a. On or before October 1, 1988, the permittee shall submit and receive approval of a monitoring, sampling, and analysis plan.
- b. On or before March 1, 1989, the permittee shall submit the analytical results of such monitoring.

5. If the discharges authorized by this permit are expected to continue beyond the expiration date of this permit, the permittee is required to submit an application for reissuance to the Chief of the Surface Water Quality Division on or before April 1, 1992.

6. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the Chief of the Surface Water Quality Division either a report of progress or, in the case of specific actions being required by identified dates, a written statement of compliance or noncompliance. In the latter case, the statement shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement. Failure to submit the written statement is just cause to pursue enforcement action pursuant to the Commission Act and the Part 21 Rules.

## PART II

## A. MANAGEMENT REQUIREMENTS

## 1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of Public Acts 245, of 1929, as amended, and/or PL 92-500, as amended, and constitutes grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of an application for permit renewal.

## 2. Change of Conditions

Any anticipated facility expansion, production increases, or process modification which will result in new, different, or increased discharges of pollutants must be reported by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutant not previously limited.

## 3. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of concentrated solutions, acids, alkalis, salts, oils, or other polluting materials in accordance with the requirements of the Michigan Water Resources Commission Rules, Part 5. This requirement is included pursuant to Section 5 of the Michigan Water Resources Commission Act 245, P.A. of 1929, as amended, and the Part 5 Rules of the General Rules of the Commission.

## 4. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified by the Michigan Water Resources Commission, as required by Section 6a of the Michigan Act.

## 5. Noncompliance Notification

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Chief of the Surface Water Quality Division with the following information, in writing, within five (5) days of becoming aware of such condition:

- a. A description of the discharge and cause of noncompliance; and
- b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

## PART II

## Section A.

## 6. Spill Notification

The permittee shall immediately report any spill or loss of any product, by-product, intermediate product, oils, solvents, waste material, or any other polluting substance which occurs to the surface waters or groundwaters of the state by calling the Department of Natural Resources 24-hour Emergency Response telephone number, 1-800-292-4706 (calls from out-of-state dial 1-517-373-8166); and the permittee shall within ten (10) days of the spill or loss, provide the state with a full written explanation as to the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken, and schedule of implementation. This requirement is included pursuant to Section 5 of the Michigan Water Resources Commission Act 245, P.A. of 1929, as amended.

## 7. Facility Operation

The permittee shall at all times properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

## 8. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the surface or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

## 9. By-Passing

Any diversion from or by-pass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life, personal injury, or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Michigan Water Resources Commission and the Regional Administrator, in writing, of such diversion or by-pass.

## 10. Power Failures

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

- a. Provide an alternative power source sufficient to operate facilities utilized by permittee to maintain compliance with the effluent limitations and conditions of this permit which provision shall be indicated in this permit by inclusion of a specific compliance date in each appropriate "Schedule of Compliance for Effluent Limitations".
- b. Upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

## PART II

## Section A.

## 11. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters, or the entry of toxic or harmful contaminants thereof onto the groundwaters in concentrations or amounts detrimental to the groundwater resource.

## 12. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset shall notify the Chief of the Surface Water Quality Division by telephone within 24 hours of becoming aware of such conditions and within five (5) days, provide in writing, the following information:

- a. That an upset occurred and that the permittee can identify the specific cause(s) of the upset;
- b. That the permitted wastewater treatment facility was, at the time, being properly operated;
- c. That the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

In any enforcement proceedings the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

13. Any requirement of this permit which is included under the unique terms of the Water Resources Commission, Act 245, P.A. of 1929, as amended, and rules promulgated thereunder, is not enforceable under the Federal Clean Water Act regulations.

## PART II

## B. RESPONSIBILITIES

## 1. Right of Entry

The permittee shall allow the Executive Secretary of the Michigan Water Resources Commission, the Regional Administrator and/or their authorized representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and
- b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

## 2. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Michigan Water Resources Commission and the Regional Administrator.

## 3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Act and Rule 2128 of the Water Resources Commission Rules, Part 21, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State Water Pollution Control Agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act and Sections 7 and 10 of the Michigan Act.

## 4. Permit Modification

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

- a. Violation of any terms or conditions of this permit;
- b. Obtaining this permit by misrepresentation or failure to disclose fully, all relevant facts; or
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

## PART II

## Section B.

## 5. Toxic Pollutants

Notwithstanding Part II.B.4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

## 6. Civil and Criminal Liability

Except as provided in permit conditions on "By-Passing" (Part II.A.9) and "Power Failures" (Part II.A.10), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond his control, such as accidents, equipment breakdowns, or labor disputes.

## 7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Act except as are exempted by federal regulations.

## 8. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

## 9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any Federal, State or local laws or regulations, nor does it obviate the necessity of obtaining such permits or approvals from other units of government as may be required by law.

## 10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

## 11. Notice to Public Utilities (Miss Dig)

The issuance of this permit does not exempt the permittee from giving notice to public utilities and complying with each of the requirements of Act 53 of the Public Acts of 1974, being sections 460.701 to 460.718 of the Michigan Compiled Laws, when constructing facilities to meet the terms of this permit.

DEPARTMENT OF TRANSPORTATION  
U.S. COAST GUARD  
CCGD9-162 (10-76)(mep)

POLREP ONE-AND-FINAL

U 2:

M.S.O. DETROIT

A. DATE 26 April 1980 B. PROJECT NO. N/A C. UCN 5D068/80

D. LOCATION Wyandotte, MI E. WATER AFFECTED Trenton Channel

F. SOURCE Pennwalt E. Plant - #003 outfall

G. SUBSTANCE Ferric Chloride (25%) H. QUANTITY 100 gals, 200 lbs 100% Ferric Chloride

I. CAUSE Tank containing sludge was accidentally tipped while being moved; polluting substance spilled from bottom.

J. RESPONSE ACTION At 1815 MSO Detroit received a report of a chemical spill from Mr. R. H. Geineman via NRC. MSO investigators underway 2015, arrived Pennwalt East Plant at 2105. Spoke to Robert Heinman manager of energy and environmental control about cause. Taken by shift supervisor Tom Sckonfeld to outfalls for documentation of ph scale graphs. MSO investigators departed scene 2256.

K. FUTURE PLANS Will have future patrols check ph meters for consistency; will obtain additional details about spill.

L. REPORTS SUBMITTED TO CCGD9: CG-3639

YES

CG-2636

NO

CCGD9-157

YES

CG-4890A

NO

POLLUTION FUND DOCUMENTATION

NO

M. COMMENTS None

COPY TO : CCGDNINE(mep), CLEVELAND, OH.  
EPA REGION V, CHICAGO, IL. ✓  
EPA MODO, GROSSE ILE, MI. ✓  
DNR(PEAS), LANSING, MI.  
NRC, WASHINGTON, DC.  
CASE FILE

RELEASED BY:

K. F. WASSENBERG, COMMANDER, USCG

COMMANDING OFFICER

(PIES)

Date for all data cards

Case No. 50068/80 Project No. n/a  
 Notifier Name Carey Johnson  
 Address \_\_\_\_\_  
 Phone No. 1-800-292-4701  
 On Behalf of NRC  
 Occurred Date 4-26-80 Time 1500R  
 Discovered Date 4-26-80 Time 1500R  
 Location Wyandotte Mi.  
4155 Biddle Ave.  
 Source Pennwalt East  
Plant; 003 outfall  
 Operation in Progress sludge tank  
being moved for cleaning  
 Material ferric, cocner chlorine  
 Amount 200 gallons  
 Slick Size 1/2" x 1/2" Color none  
 On-Scene Conditions  
 Wind n/a Knots Direction n/a  
 Seas n/a Feet Direction n/a  
 Current n/a Knots Direction n/a  
 Cleanup Performed ☒ (YES) (NO)  
 By \_\_\_\_\_  
 Equipment Used \_\_\_\_\_  
 Mandays Expended: (CG Regular) \_\_\_\_\_  
 (Nat'l Strike Force) none  
 (Commercial) \_\_\_\_\_  
 (Responsible Party) \_\_\_\_\_  
 (OTHER) n/a  
 Duration of Response (Days) one  
 Amount Recovered more than 100 gal.  
 Cost 0  
 Date/Time Report Rcvd 21215R Apr 80  
PRM R. Hodges  
 Person Receiving Report \_\_\_\_\_  
 Coast Guard Jurisdiction ☒ (YES) (NO)  
 Investigation ☒ (YES) (NO)  
 Investigation Results not yet  
complete  
 Investigator PRM V. Sarter

FIELD		CARD (N)	DATA
RECORD ID	District	X 1-2 (N)	<u>8 9</u> X- Required Information
	Sequence No.	3-7 (N)	
	Date of Incident	X 8-13 (N)	<u>200426</u>
	Transaction Code	X 14-16 (A)	<u>ADD</u>
ZERO CARD	Report Period Date	X 75-80 (N)	<u>800 15</u>
	Card No.	17 (N)	<u>8</u>
	Case Name	X 21-30 (A/N)	<u>PENNWALT E</u>
		31-40 (A/N)	<u>AST PLANT</u>
DISCHARGE	Project No.	51-56 (N)	
	Unit Case No.	X 61-68 (A/N/S)	<u>50068-80</u>
	Card No.	17 (N)	<u>1</u>
	Day of Week Hour	X 21-23 (N)	<u>5 15</u>
DISCHARGE	Location	X 24-33 (A/N)	<u>2421108500</u>
	State	X 34-35 (A)	<u>MI</u>
	Water Body	X 36-38 (N)	<u>502</u>
	Source	X 39-41 (N)	<u>503</u>
	Source Identifier	42-49 (A/N)	<u>00068928</u>
	Cause	X 51-52 (A)	<u>TK</u>
	Operation	X 54-55 (N)	<u>47</u>
	Material	X 56-59 (N)	<u>2122</u>
	Quantity	X 60-67 (A/N)	<u>00002000</u>
	Affected Resources	69-74 (A/N)	
DISCHARGE	Card No.	17 (N)	<u>2</u>
	Wind Speed/Direction	21-25 (N)	
	Sea Hgt./Swell Dir.	26-30 (N)	
	Current Speed/Dir.	31-35 (N)	
	Notifier	X 39-41 (A/N)	<u>LD3</u>
	Cleanup Response	X 42 (N)	<u>0</u>
	OPFAC No.	X 44-50 (N)	<u>8 9 3 3 2 5 0</u>
	Card No.	17 (N)	<u>3</u>
	Rmvl Undrtkn By	X 21 (N)	<u>1</u>
	Boom Materials	22-24 (N)	
CLEANUP RESPONSE	Recovery Devices	25-26 (N)	
	Disposable Sorbents	27-30 (N)	
	CG Regular	55-57 (N)	
	Nat'l Strike Force	61-63 (N)	
	EPA	64-66 (N)	
	Commercial	70-72 (N)	
	Card No.	17 (N)	<u>4</u>
	Responsible Party	21-23 (N)	
	Other	24-26 (N)	
	Duration of Response	X 33-35 (N)	<u>001</u> days
Amount Recovered	X 36-43 (A/N)	<u>00001003</u>	

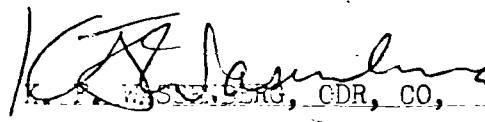
A. DATE MAY 28, 1980 B. PROJECT NO. N/A C. DCR 5D097/80  
D. LOCATION WYANDOTTE, MICHIGAN E. WATER AFFECTED DETROIT, RIVER  
F. SOURCE PENWALT CORPORATION  
G. SUBSTANCE ANHYDROUS FERRIC CHLORIDE H. QUANTITY 20 TO 30 PPM, APPROX 14,400 GAL  
I. CAUSE THE SUMP PUMPS FAILED IN THE EAST PLANT, CAUSING THE SUMP TANK TO OVERFLOW  
J. RESPONSE ACTION 1435 MSO INVESTIGATORS WERE ON TOUR OF PLANT. AT OUT FALLS #C03 THERE WAS A REDISH SUBSTANCE COMING OUT. MR. JOHN J. LEWIS, PLANT ENVIRONMENTALIST, STATED IT WAS ANHYDROUS FERRIC CHLORIDE. 1440 MR. LEWIS, CHECKED THE OUT FALLS MONITOR, IT SHOWED THE WATER FLOW TO BE APPROX 4800 GPM WITH 20 TO 30 PPM. MR. LEWIS, TOOK SAMPLES TO BE ANALYZED BY PLANT LABORATORY. THE SUBSTANCE WAS UNRECOVERABLE. 1450 SUBSTANCE STOPPED. 1500 MSO INVESTIGATORS DEPARTED SCENE.  
K. FUTURE PLANS MONITOR ON FUTURE HARBOR PATROLS

REPORTS SUBMITTED TO CCGD9: - CG-3639 ☒ YES CG-2636 ☒ NO  
CGD9-157 ☒ YES CG-4890A ☒ NO POLLUTION FUND DOCUMENTATION ☒ NO

COMMENTS WAITING FOR THE RESULTS OF THE SAMPLES,

COPY TO : CCGDNINE(dep), CLEVELAND, OH.  
EPA REGION V, CHICAGO, IL.  
EPA MODO, GROSSE ILE, MI. ✓  
DNR(PEAS), LANSING, MI.  
NRC, WASHINGTON, DC.  
CASE FILE

RELEASED BY:

  
K. A. WESSENBURG, CDR, CO, USN  
COMMANDING OFFICER

POLLUTION INCIDENT REPORTING SYSTEM  
(PIRS)

Columns 1 thru 16 & 75 thru 80

same for all six cards

Case No. 5D097/90 Project No. \_\_\_\_\_

Notifier: Name EM2 TIDPEN

Address M50 DIRT

Phone No. 226-7777

On Behalf of \_\_\_\_\_

Occurred Date 28 MAY 80 Time 1430

Discovered Date 28 MAY 80 Time 1435

Location PENNAULT COPP  
WHEELER MI

Source #013 OUTER FALLS  
PENNAULT EAST PLANT

Operation in Progress PROCESSING MINERALS

Material ANHYDROUS FERRIC CHLORIDE

Amount UNK

Slick Size 30x30ft Color Reddish

On-Scene Conditions

Wind \_\_\_\_\_ Knots Direction \_\_\_\_\_

Seas \_\_\_\_\_ Feet Direction \_\_\_\_\_

Current \_\_\_\_\_ Knots Direction \_\_\_\_\_

Cleanup Performed (YES) ☒ (NO) ☐

By \_\_\_\_\_

Equipment Used \_\_\_\_\_

Mandays Expended: (CG Regular) 002

(Nat'l Strike Force) \_\_\_\_\_

(Commercial) \_\_\_\_\_

(Responsible Party) \_\_\_\_\_

(OTHER) \_\_\_\_\_

Duration of Response (Days) \_\_\_\_\_

Amount Recovered \_\_\_\_\_

Cost \_\_\_\_\_

Date/Time Report Rcvd 28 MAY 80 1510

x BMI CHAFER

Person Receiving Report \_\_\_\_\_

Coast Guard Jurisdiction (YES) ☒ (NO) ☐

Investigation (YES) ☒ (NO) ☐

Investigation Results \_\_\_\_\_

Investigator \_\_\_\_\_

FIELD	CARD COLUMN	DATA
District	X 1-2 (N)	89
Sequence No.	3-7 (N)	
Date of Incident	X 8-13 (N)	800528
Transaction Code	X 14-16 (A)	A.D.D.
Report Period Date	X 75-80 (N)	800615
Card No.	17 (N)	8
Case Name	X 21-30 (A/N)	PENNAULT
	31-40 (A/N)	WYANDOTT
Project No.	51-56 (N)	
Unit Case No.	X 61-68 (A/N/S)	5D097-80
Card No.	17 (N)	1
Day of Week Hour	X 21-23 (N)	5 14
Location	X 24-33 (A/N)	L421108309
State	X 34-35 (A)	MJ
Water Body	X 36-38 (N)	502
Source	X 39-41 (N)	503
Source Identifier	42-49 (A/N)	00068928
Cause	X 51-52 (A)	N.P.
Operation	X 54-55 (N)	01
Material	X 56-59 (N)	2097
Quantity	X 60-67 (A/N)	
Affected Resources	69-74 (A/N)	
Card No.	17 (N)	2
Wind Speed/Direction	21-25 (N)	
Sea Hgt./Swell Dir.	26-30 (N)	
Current Speed/Dir.	31-35 (N)	
Notifier	X 39-41 (A/N)	GZ1
Cleanup Response	X 42 (N)	6
OPFAC No.	X 44-50 (N)	8933250
Card No.	17 (N)	3
Reml Undrtn By	X 21 (N)	0
Boom Materials	22-24 (N)	
Recovery Devices	25-26 (N)	
Disposable Sorbents	27-30 (N)	
CG Regular	55-57 (N)	001
Nat'l Strike Force	61-63 (N)	000
EPA	64-66 (N)	000
Commercial	70-72 (N)	
Card No.	17 (N)	4
Responsible Party	21-23 (N)	
Other	24-26 (N)	
Duration of Response	X 33-35 (N)	008
Amount Recovered	X 36-43 (A/N)	
Total Cost	44-51 (N/S)	

10's of feet

units

pounds

mandays

mandays

mandays

mandays

mandays

mandays

days

dollars



PENNWALT CORPORATION  
NPDES Compliance Inspection Report  
NPDES Permit No. MI 0002381  
April 28, 1978

On April 28, 1978 an EPA Compliance Inspection Evaluation was conducted by the State of Michigan at the Pennwalt Corporation's Wyandotte facility to assess the current operational status of the plant relative to NPDES Permit No. MI 0002381 and the stipulations of Final Order of Abatement No. FO 1981.

The Department of Natural Resources officials participating were: John Bohunsky, Chief of Field Operations; Carl Lohman, Sanitary Engineer and; Brian Reicks, Water Quality Specialist. Representing the Pennwalt Corporation were C.W. Gullickson, Director Environmental Affairs; William Hischke, Supervisor Environmental Affairs; and Joseph E. Rhodes, Technical Department Manager.

The following narrative addresses: (1) general plant processes and products; (2) wastewater treatment; (3) self monitoring and reporting program; (4) compliance status and; (5) hazardous material control and spill prevention and; (6) summary.

A description of manufacturing techniques has been deferred, respecting the confidentiality of corporate processes.

I. Production: The Pennwalt Corporation is engaged in the manufacture of a variety of inorganic and special organic chemicals and operates on a continuous 24 hours a day, 7 days per week schedule. Approximately 800 persons are employed at the Wyandotte complex.

The Wyandotte operations are divided, by function, into two separate facilities commonly referred to as the East Plant and the West Plant. Activities at the East Plant are geared to the production of industrial inorganic chemicals, principally calcium hypochlorite, chlorine, caustic, hydrochloric acid, ferric chloride, and sodium orthosilicate. The raw materials utilized for the inorganics operations include salt brine, lime clay, silica, scrap iron, and a variety of other lesser materials.

At the West Plant, a multiplicity of organic compounds are formulated in several designated process areas. This includes amyphenols, alkylamines, alkanolamines and rubber compounding chemicals among a wide variety of other organics. The production of zinc bearing products at the organic plant was concluded as of January 15, 1978. A pilot plant also exists for product development. Commercial

production varies with the product demands imposed by sister industries.

At the inorganic plant, common trade processes include the sal ammoniac process for the production of ammonium chloride and hydrochloric acid, the percloron process for the production of calcium hypochlorite, the orthosil process for the formulation of sodium orthosilicate and the blending of trade name cleaners, and the chlorine caustic process for the production of chlorine, caustic and hydrogen.

II. Wastewater Collection and Treatment System: The major effort of Pennwalt's wastewater treatment program is the reclamation and recycling of process chemicals. To that end, engineering for compliance imposed by the NPDES permit involved isolation of the various waste streams and recovery of many process related constituents.

Discussions of the Pennwalt's waste treatment systems has traditionally been done in terms of the process waste contributions to any one of the five separate outfalls currently being monitored. The following section follows that format.

At the East Plant, outfall 001 now contains only cooling water from the percloron process plant (calcium hypochlorite) and non contact cooling water from the chlorine liquification plant. This discharge is directly to the Wye Street Division. A separation program was initiated to achieve compliance with imposed limitation and included removal of wash waters from a vehicle maintenance area to 002 and rerouting of effluent from a wet scrubber to outfall 002. The separation at outfall 001 was noted as being complete in an inspection conducted on 3/30/77. Currently this discharge is made through a single connection to the Wye Street sewer. There is no treatment associated with this discharge beyond the separation program which was completed to achieve the imposed effluent limitations.

Outfall 002 contains a number of separate contributory waste streams. They are: untreated yard drainage; contact condenser water from the caustic evaporator process; contact condenser water from the 70% caustic concentration which is equipped for pH control; chlorine gas cell room noncontact cooling water and truck garage drainage. Titanium heat exchangers were installed to replace an older direct contact chlorine cooling system. Condensed chlorine laden water vapor is stripped of chlorine and reintroduced into the plant's river water intake to serve the convenient purpose of controlling algae growth. Treatment of waste streams consist of automatic neutralization of barometric condenser waters in the caustic evaporator department. This discharge is directly to the Detroit River.

Outfall 003 at the East Plant also consists of a number of miscellaneous flows from both process sources and non contact uses. The noncontact portion includes water from the sal ammoniac plant and cooling water and cell washwater from the chlorine cell room. Other flows include

3      Equipment and floor washwater from the liquid ferric chloride and anhydrous ferric chloride buildings; barometric condenser cooling water, dust scrubber wastewater and equipment washdown water from the sal ammoniac plant; and wastewater from the caustic flaker dust scrubbers and the bin washing stations in the caustic finishing department. Treatment at 003 is limited to a settling basin for the recovery of asbestos fibers. Before the initiation of the separation program to achieve compliance on all outfalls, 003 received wastewater from the sodium orthosilicate synthesis process.

To achieve effluent limitations on TSS and pH, it was necessary to isolate the orthosilicate waste stream from outfall 003 and redirect the stream to the pond system of outfall 005. Because it was found that the orthosilicate process waste previously discharged thru 003 was basically incompatible with the percloron process (calcium hypochlorite) wastewater normally discharged from the 005 settling pond system, diversion of the orthosilicate waste stream was delayed until a satisfactory degree of pretreatment could be accomplished by reduction in residual chlorine using hydrogen peroxide. This system is currently operational. In addition, the segregation of bleach liquor and contractual sale to the Wayne County Board of Public Works was finalized in May of 1975.

Outfall 005 contains treated process effluent from the anhydrous caustic department, caustic filtration washwater and evaporation process waste, brine purification wastewater and backwash water from the brine filters. The hydrogen peroxide treatment unit is used in the pretreatment of percloron process waste to allow the present diversion of orthosilicate waste to the 005 system. Preliminary engineering review found that reduced percloron process waste could be combined with the orthosilicate wastewater with the addition of HCl. Acidification was found to prevent the formation of the nonsettling floc and the formation of calcium silicate which previously made the settling ponds ineffectual for TSS removal. pH control must be conducted within a restricted range to prevent the release of free chlorine to the air.

The 005 system consists of two parallel settling ponds used alternately to settle solids from the various contributory waste sources. When a pond becomes unusable due to solids build-up, the material is dredged and slurried with brine from one of the brine wells and pumped to a brine well cavity. During the dredging period, a waste stream from the brine purification process enters the pond. An acid storage tank is maintained at the pond area for the neutralization of alkaline pond effluent. This discharge is also directly to the Detroit River.

Outfall 006 discharges process effluent and cooling water from the organics operations at the West Plant. Process wastewater is generated by alkylamine, alkanolamine and amyl phenol development. Initial measures taken for the reduction of phenolic wastes involved the installation of a wet scrubbing system and the reclamation of scrubber effluent. Elimination and recovery of amines from the waste stream by a scrubber-stripper system was a design proposed for ammonia and pH control. The installation of zinc compound control facilities no longer became necessary when zinc bearing chemicals were

phased out of the production schedule. Treatment beyond in-plant recovery systems is limited to a settling pond system for the removal of solids. A number of process flows are diverted to the first pond designated as Pond 1. Phenolic wastes are discharged to Pond 2. The decant from the thylac sludge beds as well as effluent from Ponds 1 and 2 enter Pond 3. Flow from Pond 3 enters a drainage ditch which also receives wastewater directly from Process 21 (alkylamines) and Process 47 (alkanolamines). A final pond designated Pond 4 is equipped with a primary and secondary skimming baffle, solids retention baffle and an oil containment boom. The discharge from Pond 4 is to Monguagon Creek and constitutes a portion of outfall 006. The remaining portion of outfall 006 consists of non contact cooling water that was diverted from Pond 4 to increase retention time and solids retention capability. This stream is diverted around the pond and reenters the discharge just before the measuring flume.

The intake water treatment system consists of two traveling water screens and the periodic injection of a small amount of chlorine to minimize algae growth.

III. Self Monitoring Program: In accordance with monitoring requirements, Pennwalt installed various effluent flow measuring and sampling devices at each outfall station. Outfall 001 is equipped with a Dupont Model ultrasonic flow meter and flow monitor and recorder. A history of repeated mechanical problems with the ultrasonic device can be documented. At the time of the inspection, the unit was not functioning adequately. Visually, the discharge was clear, colorless, with light turbidity and no perceptible oil film.

Installed at outfall 002 are two 24" Parshall flumes with float operated transducers, flow monitor and recorder. In addition, a time proportional composite sampler and pH recorder are in place. During the inspection the effluent at 002 appeared to be reasonably clear, light green in color with light turbidity and no visible oil.

Outfall 003 is monitored for flow by a DuPont Model 580 ultrasonic flowmeter and a flow monitor and recorder. A time proportional composite sampler is utilized for sample collection with a continuous pH recorder. The discharge was not visible to permit a physical description.

Outfall 005 is equipped with a Parshall flume for flow measurement, an automatic time proportional composite sampler. The discharge from Pond 4 was mildly turbid, with no visible oil and was indistinguishable from the background color of the receiving stream.

The analyses of samples taken to determine effluent quality is performed in accordance with Standard Methods on all parameters excepting  $\text{NH}_3\text{-N}$ . Ammonia nitrogen analysis is conducted by the applicable EPA technique. Grab and composite samples are analyzed soon after collection at the company laboratory within permissible holding times. With the sole exception of copper sulfate used to inhibit biochemical oxidation of phenol samples, collected samples are generally not preserved upon collection. For quality control assurance, duplicate and spiked samples are run periodically.

The plant does not currently have a waste treatment plant operator certified under Section 6a of Act 245, P.A. 1929, as amended. William Hischke has been designated by the company as their operator but he is not State certified.

IV. Compliance Status: The Pennwalt Corporation has experienced repeated violations of effluent standards attributed to numerous equipment failures and other causes. Since July 1, 1977, the company has reported excursions for most outfalls during every month thru February of 1978, for which operating reports have been filed. Parameters apparently exceeded at least once for the various outfalls include suspended solids, pH and residual chlorine at outfall 002; outfall 003, pH; outfall 005, pH and net suspended solids; outfall 006, suspended solids, COD, BOD<sub>5</sub>, ammonia nitrogen and residual chlorine. High pH readings at outfall 006 have been constantly attributed to operational difficulties with the methane sulfonyl chlorine process since early 1977, indicating that a concerted effort to correct this problem has been lacking.

The construction of abatement facilities for compliance with effluent standards was completed by December 31, 1977. Attainment of operational level was required by final order for outfall 002 by October 1, 1977, for outfalls 003 and 005 by April 1, 1978 and for outfall 006 by February 1, 1978. To date, confirmation of operational level at outfalls 003, 003, 005 and 006 has not been received.

During the Point Source Studies Survey of April 5 & 6, 1978, the accumulation of asbestos fibers was noted in outfall 003. The asbestos results when a cell diaphragm is reworked in the hydrogen cell room. Although a metal box is used for settling of the fibrous material, effective recovery of the asbestos has not been accomplished.

Pennwalt has been responsible for the inadvertent spill of various polluting materials. This culminated in the loss of a material identified as butyl ziram, a possible mutagenic and carcinogenic agent, on December 31, 1977.

The Point Source Studies Section observed a distinct lack of housekeeping in the area of outfall 005, including an undiked acid storage tank. In addition, the survey crew noted a poorly plugged breach in a containment lagoon at the west plant. The facility inspection confirmed that observation on April 28, 1978. The survey crew also viewed areas where leakage from the lagoon had occurred.

V. Hazardous Materials Control: The Pennwalt Corporation filed a Pollution Incident Prevention Plan in accordance with the Part 5 Rules of the Michigan Water Resources Commission which was acknowledged on January 17, 1974. This plant has not yet been approved due to delays in the company's responding to necessary additions and changes. By letter of January 17, 1978, the company was asked to clarify several matters that are preventing approval of the PIPP Plan.

No response has been received yet. The inspectors observed on April 28, 1978, the lack of designated and properly restricted areas for barrel storage of chemicals. The company has been repeatedly cautioned of the necessity for the adequate containment of stored chemicals.

Summary: The compliance of the Pennwalt Corporation has been unsatisfactory, both in terms of meeting effluent limitations and with hazardous materials control and the past losses of polluting chemicals. Based upon this fact, it is felt that the company may not comply with future restrictions and effluent limitations with present methods of operation.

500-4-7014

Dr. Howard A. Tanner, Director  
Michigan Department of Natural Resources  
Post Office Box 30028  
Lansing, Michigan 48909

NOV 13 1977

*File Pennwalt  
NPDES*

Re: Pennwalt Corporation  
Final Order No. 1981

Dear Dr. Tanner:

The Michigan Department of Natural Resources (MDNR) issued a Final Order of Abatement (Final Order No. 1981) to the Pennwalt Corporation, Wyandotte, Michigan, on October 20, 1977. A copy of the signed Final Order was received by the United States Environmental Protection Agency (U.S. EPA) on November 7, 1977.

In a letter dated October 31, 1977, from Dale S. Bryson, Acting Director, Enforcement Division, U.S. EPA to Robert J. Courchaine, Chief, Water Quality Division, MDNR, the U.S. EPA sent its comments on the proposed Final Order. This letter was received by the MDNR after the Final Order had been signed.

The Pennwalt Corporation Final Order does not include initial effluent limitations at outfall 003 for total suspended solids (TSS) loadings and concentrations and ammonia as nitrogen (NH<sub>3</sub>-N) concentration. The U.S. EPA feels that the MDNR has ample data from past monitoring of TSS and NH<sub>3</sub>-N to determine appropriate initial daily maximum limits.

The U.S. EPA requests that the MDNR submit the information used in making the decision to omit initial limits for TSS and NH<sub>3</sub>-N in the Final Order. The U.S. EPA also requests information concerning how the MDNR shall insure that Pennwalt Corporation will operate its existing treatment facilities to optimize TSS and NH<sub>3</sub>-N removal during the period before final effluent limitations come into effect.

Please address any written response to the Enforcement Division, Attention: Compliance Unit.

Very truly yours,

James O. McDonald, Director  
Enforcement Division

cc: Mr. Robert J. Courchaine, Chief  
Water Quality Division, MDNR

bcc: Mr. David M. Lyons, Chief, Compliance Branch  
Office of Water Enforcement, HQ

Constantelos/Harsch/Mutnan  
Ginsberg/Bloom; Hallgren/Winkhofer; Leder

RECEIVED  
NOV 13 1977

MAILED 101-111-1011011  
111



JUN 22 1977

JUN 22 1977

Mr. Wayne E. Denniston  
Assistant Division Chief for Enforcement  
Water Quality Division  
Bureau of Environmental Protection  
Michigan Department of Natural Resources  
Stevens T. Mason Building  
Lansing, Michigan 48926

Re: NPDES Permit No. MI 0002291  
Standard Tube Company

BODES Permit No. MI 0002381  
Pennwalt Corporation

Dear Mr. Denniston:

The attached memoranda from our Eastern District Office concerning the referenced permits are being sent to you for your information and enforcement action.

In the case of Standard Tube Company MI 0002291, there appears to be improper oil and grease sample preservation and possibly incorrect reporting.

In the case of Pennwalt Corporation MI 0002381, your agency notified our Eastern District Office of a spill. The discharge consisted of between 500 and 1,000 gallons of a mixture of monoamylamine, diamylamine, and triamylamine.

Please advise us in writing of any enforcement action your office initiates in these cases. If you have any questions regarding the above, please contact Ms. Mariann Baumgartner of my staff at (312) 353-2114.

Very truly yours,

Carol R. Foglesong, Chief  
Compliance Unit  
Enforcement Division

Attachments

cc: Eastern District Office

WASTE WATER  
NPDES MONITORINGSAMPLING POINT: SOUTH INTAKE

DATE ANALYZED: \_\_\_\_\_

DATE REPORTED: \_\_\_\_\_

TIME OF SAMPLING: \_\_\_\_\_

COMPOSITE DATE: \_\_\_\_\_

GRAB DATE: \_\_\_\_\_

TEMPERATURE: \_\_\_\_\_ °C \_\_\_\_\_ °F

TESTED BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

SM - STANDARD METHODS OF WATER AND WASTE WATER,  
14th EDITION  
STORET - EPA METHODS

	1.	2.	3.	4.	5.	6.
ABOVE LIMITS						

PARAMETER	ANSWER	LIMIT		ANSWER	LIMIT
1. mg/l suspended solids =			3. pH =		
2. mg/l chloride =			4. C.O.D. =		
NOTE: $10^6 = 1,000,000$					

1. S.S. - Daily  
SUSPENDED SOLIDS - COMPOSITE - mg/l METHOD SM - 208D

Gross wt. =										Results
(-)										
Tare wt. =									ml sample	mg/l S.S.
Ppt. wt. =				X	$10^6$	$\div$			100 ml	=

Cl - Mon., Wed., Fri.  
CHLORIDES - COMPOSITE - mg/l METHOD SM - 208D

Results										
mg/l Cl =	ml AgNO <sub>3</sub>	X	N AgNO <sub>3</sub>	X	mew	X	$10^6$	$\div$		ml sample
		X	0.085528	X	0.035453	X	$10^6$	$\div$		100 ml

3. pH - Mon., Wed., Fri.  
pH - COMPOSITE - METHOD STORET 00400

pH = \_\_\_\_\_

4. C.O.D. - Tues., Thur., Fri.  
CHEMICAL OXYGEN DEMAND - COMPOSITE - mg/l METHOD STORET 0340

a. Standardization:	Normality of FeSO <sub>4</sub> ·(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>									
N FeSO <sub>4</sub> ·(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	=	ml K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	X	N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	$\div$				ml FeSO <sub>4</sub> ·(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	
	=	25	X		$\div$					

b. C.O.D. - mg/l

mg/l C.O.D.	=	(Blank	-	Titer)	X	N FeSO <sub>4</sub> ·(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	X	mer
	=	(	-	)	X		X	

6.	C.O.D. See Page 2
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Page 2 - 001 MONITORING

GRAB DATE: \_\_\_\_\_

ANALYSIS DATE: \_\_\_\_\_

6. C.O.D. - Tues., Thur., Fri.

CHEMICAL OXYGEN DEMAND - GRAB - mg/l METHOD STORET 0340

a. Standardization: Normality of  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$ 

N $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$	=	ml $\text{K}_2\text{Cr}_2\text{O}_7$	X	N $\text{K}_2\text{Cr}_2\text{O}_7$	$\div$	ml $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$
--	---	--------------------------------------	---	-------------------------------------	--------	---

	=		X		$\div$	
--	---	--	---	--	--------	--

b. C.O.D. - mg/l

Results mg/l C.O.D.	=	(Blank-Sample)	X	N $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$	X	mew	X	$10^6$	$\div$	ml sample
	=	( - )	X		X	0.008	X	$10^6$	$\div$	50
	=		X		X	0.008	X	$10^6$	$\div$	50

WASTE WATER  
NPDES MONITORING

SAMPLING POINT: 002 MAIN ST.

DATE ANALYZED: \_\_\_\_\_

DATE REPORTED: \_\_\_\_\_

TIME OF SAMPLING: \_\_\_\_\_

COMPOSITE DATE: \_\_\_\_\_

GRAB DATE: \_\_\_\_\_

TEMPERATURE: \_\_\_\_\_ °C \_\_\_\_\_ °F

SM - STANDARD METHODS OF WATER AND WASTE WATER,  
14th EDITION  
STORET - EPA METHODS

TESTED BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

ABOVE  
LIMITS

1.

2.

3.

4.

5.

6.

NOTE:  $10^6 = 1,000,000$ 

PARAMETER	ANSWER	LIMIT		ANSWER	LIMIT
1. mg/l suspended solids =		12	4. mg/l ammonia as N =		1.4
2. mg/l residual chlorine =		1.0	5. pH =		6.5-9.5
3. mg/l chloride =			6. mg/l C.O.D. =		

1.	S.S. - Daily SUSPENDED SOLIDS - COMPOSITE - mg/l METHOD SM - 208D										
	Gross wt. =										
	(-)										
	Tare wt. =		X	$10^6$	÷	ml sample	=	Results	mg/l S.S.		
	Ppt. wt. =		X	$10^6$	÷	100	=				
2.	Res. Cl <sub>2</sub> - Daily RESIDUAL CHLORINE - GRAB - mg/l METHOD SM - 409E										
	a. 1 ml of FeSO <sub>4</sub> ·(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> = 100 micrograms of residual chlorine										
	Results										
	b. mg/l Res. Cl <sub>2</sub>	=	Titer	X	Micrograms/ml	÷	ml sample				
		=		X	100	÷	100				
3.	Cl - Mon.,Wed.,Fri. CHLORIDES - COMPOSITE - mg/l METHOD SM - 408A										
	Results										
	mg/l Cl	=	ml AgNO <sub>3</sub>	X	N AgNO <sub>3</sub>	X	mew	X	$10^6$	÷	ml sample
		=		X	0.085528	X	0.035453	X	$10^6$	÷	100
4.	NH <sub>3</sub> -N - Mon.,Wed.,Fri. AMMONIA AS NITROGEN - COMPOSITE - mg/l METHOD STORET 00610										
	a. Absorbance Method:										
	Spectrophotometric absorbance reading = _____ = _____ mg N										
	Results										
	mg/l NH <sub>3</sub> -N	=	mg N	X	1.000	÷	400 x $\frac{10}{500}$				
		=		X	1.000	÷	8				
	b. Titration Method										
	Results										
	mg/l NH <sub>3</sub> -N	=	ml H <sub>2</sub> SO <sub>4</sub>	X	N H <sub>2</sub> SO <sub>4</sub>	X	mew	X	$10^6$	÷	400 x $\frac{480}{500}$
		=		X	0.02	X	0.01401	X	$10^6$	÷	384
5.	pH - Daily pH - COMPOSITE - METHOD STORET 00400										
							pH	=			
6.	C.O.D. See Page 2										

Page 2 - MONITORING - 002

COMPOSITE DATE: \_\_\_\_\_  
ANALYSIS DATE: \_\_\_\_\_

6. C.O.D. - Tues., Thur., Fri.

CHEMICAL OXYGEN DEMAND - COMPOSITE - mg/l METHOD STORET 0340

a. Standardization: Normality of  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$

N $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$	=	ml $\text{K}_2\text{Cr}_2\text{O}_7$	X	N $\text{K}_2\text{Cr}_2\text{O}_7$	$\div$	ml $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$
	=	25	X		$\div$	

b. C.O.D. - mg/l

Results mg/l C.O.D.	=	(Blank-Sample)	X	N $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$	X	mew	X	$10^6$	$\div$	ml sample
	=	( - )	X		X	0.008	X	$10^6$	$\div$	50
	=		X		X	0.008	X	$10^6$	$\div$	50

WASTE WATER  
NPDES MONITORING

SAMPLING POINT: 003 WAYNE CO. DATE ANALYZED: DATE REPORTED:

TIME OF SAMPLING: COMPOSITE DATE: GRAB DATE:

TEMPERATURE: °C °F

TESTED BY: APPROVED BY:

SM - STANDARD METHODS OF WATER AND WASTE WATER,  
14th EDITION  
STORET - EPA METHODS

	1.	2.	3.	4.	5.	6.
ABOVE LIMITS						

NOTE:  $10^6 = 1,000,000$

PARAMETER	ANSWER	LIMIT	PARAMETER	ANSWER	LIMIT
1. mg/l suspended solids =		17	4. mg/l ammonia as N =		3.0
2. mg/l residual chlorine =		1.0	5. pH =		6.5-9.5
3. mg/l chloride =					

1.	S.S. - Daily SUSPENDED SOLIDS - GRAB - mg/l METHOD SM - 208D										
	Gross wt. =										
	(-) Tare wt. =			X	$10^6$	÷	ml sample	=	Results mg/l S.S.		
	Pnt. wt. =			X	$10^6$	÷	100	=			
2.	Res. Cl <sub>2</sub> - Daily RESIDUAL CHLORINE - GRAB - mg/l METHOD SM 409E										
	a. 1 ml of FeSO <sub>4</sub> ·(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> = 100 micrograms of residual chlorine										
	Results b. mg/l Res. Cl <sub>2</sub>	=	Titer	X	Micrograms/ml	÷	ml sample				
		=		X	100	÷	100				
3.	Cl - Mon.,Wed.,Fri. CHLORIDES - COMPOSITE - mg/l METHOD SM - 408A										
	Results mg/l Cl	=	ml AgNO <sub>3</sub>	X	N AgNO <sub>3</sub>	X	mew	X	$10^6$	÷	ml sample
		=		X	0.085528	X	0.035453	X	$10^6$	÷	100
4.	NH <sub>3</sub> -N - Mon.,Wed.,Fri. AMMONIA AS NITROGEN - COMPOSITE - mg/l METHOD STORET 00610										
	a. Absorbance Method: Spectrophotometric absorbance reading = = mg N										
	Results mg/l NH <sub>3</sub> -N	=	mg N	X	1,000	÷	400 x 500				
		=		X	1,000	÷	8				
	b. Titration Method:										
	Results mg/l NH <sub>3</sub> -N	=	ml H <sub>2</sub> SO <sub>4</sub>	X	N H <sub>2</sub> SO <sub>4</sub>	X	mew	X		÷	400 x 480
		=		X	0.02	X	0.01401	X	$10^6$	÷	384
5.	pH - Daily pH - COMPOSITE - METHOD STORET 00400										
	pH	=									

WASTE WATER  
NPDES MONITORING

SAMPLING POINT: 005 POND

DATE ANALYZED: \_\_\_\_\_

DATE REPORTED: \_\_\_\_\_

TIME OF SAMPLING: \_\_\_\_\_

COMPOSITE DATE: \_\_\_\_\_

GRAB DATE: \_\_\_\_\_

TEMPERATURE: \_\_\_\_\_ °C \_\_\_\_\_ °F

TESTED BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

SM - STANDARD METHODS OF WATER AND WASTE WATER,  
14th EDITION  
STORET - EPA METHODS

	1.	2.	3.	4.	5.	6.
ABOVE LIMITS						

NOTE:  $10^6 = 1,000,000$

PARAMETER	ANSWER	LIMIT		ANSWER	LIMIT
1. mg/l suspended solids =		35	4. mg/l ammonia as N =		1.0
2. mg/l residual chlorine =		1.0	5. pH =		6.5-9
3. mg/l chloride =			6. mg/l C.O.D. =		

1. S.S. - Mon., Tues., Wed., Thur., Fri.

SUSPENDED SOLIDS - GRAB - mg/l METHOD SM - 208D

Gross wt. =										
(-)										
Tare wt. =			X	$10^6$	$\div$	ml sample	=	Results	mg/l S.S.	
Ppt. wt. =			X	$10^6$	$\div$	100	=			

2. Res. Cl<sub>2</sub> - Daily - 7 days/wk.

RESIDUAL CHLORINE - GRAB - mg/l METHOD SM - 409E

a. 1 ml of FeSO<sub>4</sub>·(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> = 100 micrograms of residual chlorine.

Results										
b. mg/l Res. Cl <sub>2</sub>	=	Titer	X	Micrograms/ml	$\div$	ml sample				
	=		X	100	$\div$	100				

3. Cl - Mon., Wed., Fri.

CHLORIDES - COMPOSITE - mg/l METHOD SM - 408A

Results										
mg/l Cl	=	ml AgNO <sub>3</sub>	X	N AgNO <sub>3</sub>	X	mew	X	$10^6$	$\div$	ml sample
	=		X	0.085528	X	0.035453	X	$10^6$	$\div$	5

4. NH<sub>3</sub>-N - Mon., Wed., Fri.

AMMONIA AS NITROGEN - COMPOSITE - mg/l METHOD STORET 00610

a. Absorbance Method:

Spectrophotometric absorbance reading = = mg N

Results										
mg/l NH <sub>3</sub> -N	=	mg N	X	1,000	$\div$	$400 \times \frac{10}{500}$				or 8 ml net sample
	=		X	1,000	$\div$	8				

b. Titration Method:

Results										
mg/l NH <sub>3</sub> -N	=	ml H <sub>2</sub> SO <sub>4</sub>	X	N H <sub>2</sub> SO <sub>4</sub>	X	mew	X	$10^6$	$\div$	$400 \times \frac{480}{500}$
	=		X	0.02	X	0.01401	X	$10^6$	$\div$	384

5. pH - Daily - 7 Days.

pH - COMPOSITE METHOD STORET 00400

pH =

6. C.O.D. See Page 2



COMPOSITE DATE: \_\_\_\_\_  
ANALYSIS DATE: \_\_\_\_\_

6. C.O.D. - Tues., Thur., Fri.

CHEMICAL OXYGEN DEMAND - COMPOSITE - mg/l METHOD STORET 0340

a. mg/l Cl from step 3, page 1 = mg/l

b. Calculation of how much  $\text{HgSO}_4$  to add to sample:

1. A 50 ml sample is used for C.O.D.

2. mg/l Cl  $\div 20$  =  $\div 20$  = mg Cl in 50 ml sample.3. mg Cl in 50 ml  $\div 1000$  = grams Cl in 50 ml sample4. g Cl in 50 ml  $\times 10$  = g  $\text{HgSO}_4$  to add to C.O.D. sampleEnough  $\text{HgSO}_4$  is added to take care of 10 x Cl present.

c. Calculation of how much NaCl to add to Salt Correction Sample:

1. g Cl in 50 ml  $\times 1.6485$  = g NaCl to add to Salt Correction Sample

2. 1.6485 = NaCl/Cl mol. wt. ratio

d. Standardization: Normality of  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$ 

N $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$	=	ml $\text{K}_2\text{Cr}_2\text{O}_7$	X	N $\text{K}_2\text{Cr}_2\text{O}_7$	$\div$	ml $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4$
	=	25	X		$\div$	

e. C.O.D. on sample before salt correction:

mg/l C.O.D.	=	(Blank - Sample)	X	N $\text{K}_2\text{Cr}_2\text{O}_7$	X	mew	X	$10^6$	$\div$	ml sample
	=	( - )	X		X	0.008	X	$10^6$	$\div$	50
	=		X		X	0.008	X	$10^6$	$\div$	50

f. C.O.D. on salt correction sample:

mg/l C.O.D.	=	(Blank - Sample)	X	N $\text{K}_2\text{Cr}_2\text{O}_7$	X	mew	X	$10^6$	$\div$	ml sample
	=	( - )	X		X	0.008	X	$10^6$	$\div$	50
	=		X		X	0.008	X	$10^6$	$\div$	50

g. Net mg/l C.O.D. in 005:

Results mg/l C.O.D.	=	mg/l C.O.D. on uncorrected sample (Step e)	-	mg/l C.O.D. on salt corrected sample (Step f)
	=		-	

LABORATORY REPORT - OUTFALL 006  
NPDES MONITORING

Date Sampled: Comp: \_\_\_\_\_ Analyzed and Reported: \_\_\_\_\_  
" " Grab: \_\_\_\_\_ Signed: \_\_\_\_\_

PARAMETER	UNITS	METHOD	SAMPLE	OUTFALL 006			SOUTH INTAKE	NON- CONTACT
				AVE.	MAX.	RESULT		
Temp.	°F		-			_____		
Res. Cl <sub>2</sub>	mg/l	SM-409E	Grab		0.5	_____		
Chlorides	mg/l	SM-408A	Comp		147*	_____		
NH <sub>3</sub> -N	mg/l	EPA-00610	Grab	1.5	3.0	_____		_____
Sus. Solid	mg/l	SM-208D	Comp.	6.3	9.5*	_____		
COD	mg/l	SM-508	Comp.			_____		
BOD <sub>5</sub>	mg/l	SM-507	Comp.	6.3	9.5	_____	_____	
BOD <sub>5</sub> DATE SAMPLED		-	-			_____	_____	
Phenol	ug/l	SM-510C	Comp.		200	_____		
Sulfides	mg/l	SM <sub>1</sub> -228A	Comp.			_____		

pH CHECK

LAB \_\_\_\_\_  
RECORDER \_\_\_\_\_  
METER \_\_\_\_\_  
GATEHOUSE \_\_\_\_\_

SM = Standard Methods, Water and Waste Water 14th Edition

SM<sub>1</sub> = Standard Methods, Water and Waste Water 13th Edition

EPA = Environmental Protection Agency Manual 1974 Edition

\*NPDES limits are expressed in Net #/Day. Limits shown are based on an average flow of 7.2 MGD. Reported values are on a gross basis.

DISTRIBUTION: B100, E40, G96, G100, K4, L5, M41, M47, P28, R8, S72, Shift Supt. W

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
WATER RESOURCES COMMISSION

IN THE MATTER OF  
  
Pennwalt Corporation

KRPDES PERMIT NO. MI 0002381  
WRC NO: NC-12-80-26-3746  
FINAL ORDER NO. 1931

NOTICE OF NONCOMPLIANCE

TO: Pennwalt Corporation  
4655 Biddle Avenue  
Wyandotte, Michigan 48192

Attention: John J. Lewis, Supervisor Environmental Control

PLEASE BE ADVISED that we have sufficient information to believe that your facility has failed to comply with the terms and conditions of your National Pollutant Discharge Elimination System Permit issued on June 20, 1975 and Final Order of Abatement entered on October 20, 1977.

PURSUANT to the terms of the aforementioned Order (Part I, Sections A.6, A.7, A.8 and A.9), any discharge from your facility is limited to the following:

Effluent Characteristics	Outfall No.	Discharge Limitations		
		lbs/day		mg/l
		Daily Average	Daily Maximum	Daily Maximum
Suspended Solids	002	1856	3711	
Ammonia Nitrogen	006			3.0
Phenol	006		10	0.2
BOD-5	006	380	570	
pH	002, 003, 005 006	The pH shall not be less than 6.5 nor greater than 9.5		

The monthly monitoring report submitted for the month of October 1980 shows that your facility exceeded its authorized discharge limits according to the following:

Date Sampled	Outfall No.	Effluent Characteristic	Reported Values
10/1/80	002	Suspended Solids	4660 lbs/day
10/6/80	002	Suspended Solids	4280 lbs/day
10/7/80	002	Suspended Solids	4641 lbs/day
10/9/80	002	Suspended Solids	4483 lbs/day
10/10/80	002	Suspended Solids	4964 lbs/day
10/12/80	002	Suspended Solids	4497 lbs/day
10/13/80	002	Suspended Solids	3872 lbs/day
10/16/80	002	Suspended Solids	4101 lbs/day
10/21/80	002	Suspended Solids	3775 lbs/day
10/25/80	002	Suspended Solids	5982 lbs/day
10/26/80	002	Suspended Solids	4651 lbs/day
October 1980 Avg.	002	Suspended Solids	3353 lbs/day
10/30/80	006	Ammonia Nitrogen	3.40 mg/l
10/5/80	006	Phenol	25.35 lbs/day
10/5/80	006	Phenol	0.39 mg/l

Date Sampled	Outfall No.	Effluent Characteristic	Reported Values
10/1/80	006	BOD <sub>5</sub>	626 lbs/day
10/2/80	006	BOD <sub>5</sub>	1620 lbs/day
10/7/80	006	PCD <sub>5</sub>	931 lbs/day
10/8/80	006	BOD <sub>5</sub>	727 lbs/day
10/9/80	006	BOD <sub>5</sub>	1136 lbs/day
10/14/80	006	BOD <sub>5</sub>	780 lbs/day
10/15/80	006	BOD <sub>5</sub>	842 lbs/day
10/16/80	006	BOD <sub>5</sub>	1400 lbs/day
10/21/80	006	BOD <sub>5</sub>	2438 lbs/day
10/22/80	006	BOD <sub>5</sub>	1037 lbs/day
10/23/80	006	BOD <sub>5</sub>	632 lbs/day
10/28/80	006	BOD <sub>5</sub>	1823 lbs/day
10/29/80	006	BOD <sub>5</sub>	1482 lbs/day
10/30/80	006	BOD <sub>5</sub>	2283 lbs/day
October 1980 Avg.	006	BOD <sub>5</sub>	1267 lbs/day

pH Reported Values

Date Sampled	Outfall 002	Outfall 003	Outfall 005	Outfall 006
10/1/80	11.9			
10/2/80	9.6			
10/6/80	10.7			9.9
10/8/80		6.2		
10/10/80	11.3			
10/10/80	6.2			
10/11/80	5.9			
10/13/80	6.1			
10/14/80	10.9	11.2	11.2	
10/14/80	2.1			
10/17/80		6.4		
10/18/80	6.4			
10/18/80	9.7	6.3		
10/19/80	9.8			
10/20/80	9.8			
10/21/80		10.0		
10/23/80	6.3	5.9		
10/26/80	6.3			
10/28/80	6.2			
10/29/80	6.0			
10/30/80	6.3			
10/31/80		9.9		

FURTHER, PURSUANT to the terms of the aforementioned permit (Part II, Section A.1); "All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit."

BE ADVISED that the discharges cited in this Notice of Noncompliance are violations of NPDES Permit No. MI 0002381.

BE ADVISED that despite efforts by the Company toward resolution of the effluent problems and other matters the violations continue. Pennwalt Corporation is hereby put on Notice that further enforcement action may be instituted if the violations persist.

WATER RESOURCES COMMISSION  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

*Robert J. Courchaine*

Date Issued: December 29, 1980

Robert J. Courchaine  
Executive Secretary

by:

*Scott C. Ross*

Scott C. Ross, Chief  
Industrial Compliance Unit

ADDRESS FOR FURTHER CORRESPONDENCE

Carol L. Dixon, Water Quality Specialist  
Water Quality Division  
P.O. Box 30023  
Lansing, Michigan 48909  
Telephone: (517) 373-8448

P U B L I C   N O T I C E

Michigan Water Resources Commission  
Stevens T. Mason Building  
Box 30028  
Lansing, Michigan 48909  
517-373-8088

*pic at this  
Time  
file  
Dennis 9/19/77*

Date: August 16, 1977  
Permit Number: MI 0002381

Notice: Pennwalt Corporation presently has a valid National Pollutant Discharge Elimination System (Public Law 92-500) Permit to discharge treated process wastewater from its Wyandotte, Michigan Facility issued June 20, 1975. The permittee discharges its effluent to the Detroit River.

Federal Law 92-500 and State Law, Act 245, Public Acts of 1929, as amended, require that all discharges to the surface waters receive treatment commensurate with Best Practicable Control Technology Currently Available and capable of complying with the States Water Quality Standards by no later than July 1, 1977.

The National Pollutant Discharge Elimination System Permit issued to the Company requires the permittee to meet certain effluent limitations and a defined schedule for the construction of new or additional wastewater treatment facilities. Specifically the permittee was to have completed construction of new or additional wastewater treatment facilities and attained operational level of these facilities on or before the mandated date of July 1, 1977.

It has been determined that the Permittee will not comply with the mandated requirement of July 1, 1977.

It is hereby noticed that the Michigan Department of Natural Resources did initiate formal enforcement proceedings against the permittee for its failure to comply with the July 1, 1977 date. The Department of Natural Resources will suspend these enforcement proceedings if the Permittee agrees, stipulates, and consents to the entry of a Final Order of Abatement which orders, directs and requires the Permittee to adhere to and comply with the terms and conditions of the NPDES Permit as modified by the Final Order. Said Final Order of Abatement further orders the Permittee to build the necessary treatment facilities and attain and maintain the operational level of these facilities to the extent necessary to meet the final effluent limitations in accordance with the shortest possible construction schedule. Said Final Order requires the Permittee to meet the final effluent limitations on or before April 1, 1978.

Said Final Order further stipulates that the permittee agrees to pay as liquidated damages the sum of One Hundred Fifty Thousand Dollars (\$150,000) to the General Fund of the State of Michigan. In addition to the above amounts, the Company agrees to pay the following liquidated damages:

- a. For those days beyond September 30, 1977 that the discharge from Outfall 002 is in violation of the Final Effluent Limitations for Outfall 002 specified herein: Two Thousand Dollars (\$2,000) per day.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
WATER RESOURCES COMMISSION

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In the matter of abatement of  
water pollution: Pennwalt Corp.,  
Wyandotte, Michigan

NPDES Permit No. MI 0002381  
Final Order No.

FINAL ORDER OF ABATEMENT

- At a session of the Water Resources Commission, on 1977, at , Michigan, upon presentation by staff of the Water Quality Division, Department of Natural Resources, and based upon the official files of the Water Resources Commission:
- IT IS THE EXPRESS FINDING OF FACT of the Water Resources Commission that Pennwalt Corporation hereinafter referred to as the Company, was issued NPDES Permit No. MI 0002381 on June 20, 1975 for its Wyandotte facility in Wyandotte, Michigan, which was revised by a further permit issued March 3, 1976, which said permit of March 3, 1976 was itself revised on May 21, 1976.
- IT IS FURTHER THE EXPRESS FINDING OF FACT of the Water Resources Commission that the Company has violated, and is violating, the expressed terms and conditions of NPDES Permit No. MI 0002381 by its continued inability fully to comply with the schedule of compliance as set forth in Part I, Section C on pages 17 and 18 of said permit, although it has complied with substantial portions of the said schedule of compliance.
- IT IS FURTHER THE EXPRESS FINDING OF FACT of the Water Resources Commission that the Company has violated, is violating, and may violate certain of the final effluent limitations contained in NPDES Permit No. MI 0002381.
- IT IS FURTHER THE EXPRESS FINDING OF FACT of the Water Resources Commission that on March 18, 1977 the Company stated some of the final effluent limitations found in NPDES Permit No. MI 0002381 could not be met on or before July 1, 1977.
- IT IS FURTHER THE EXPRESS FINDING OF FACT of the Water Resources Commission that as a result of deliberations between staffs of the Company, the Attorney General's Office and the Department of Natural Resources an amicable resolution of all issues has been reached.
- IT IS FURTHER THE EXPRESS FINDING OF FACT of the Water Resources Commission that the Company has reviewed this Consent Order and while neither admitting nor denying that litigation of the issues would have resulted in a finding of the violations referred to in this Order or award of the damages set forth in this Order, has agreed to its entry as a Final Order of the Water Resources Commission.
- IT IS FURTHER ORDERED that NPDES Permit No. MI 0002381, issued on June 20, 1975, as subsequently revised, is in full force and effect except as modified by this Final Order.
- IT IS FURTHER ORDERED that the Company will control and monitor their wastewater from the date of issuance of this Final Order until the specified dates to obtain final effluent requirements in accordance with the limitations specified below:

Permit No. VI 100011

Final Order No. \_\_\_\_\_

Page Two

### Initial Effluent Limitations

During the period beginning upon the issuance of this permit and lasting until September 30, 1977, the discharge is authorized to discharge from outfall 100. Such discharge shall be limited and monitored by the limitations to be specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day	mg/l	Average	Maximum	Frequency	Method
Flow M <sup>3</sup> /Day (MGD)	-	-	-	-	3 x Weekly	-
Total Suspended Solids	-	3660(8050) Net/Net	-	50 mg/l Net	3 x Weekly	Grab
Total Chlorine Residual	-	-	-	50 mg/l	3 x Weekly	Grab
Chlorides	-	-	-	-	3 x Weekly	Grab
Ammonia (as N)	-	-	-	-	Weekly	Grab
Oil & Grease	-	-	No visible film		Daily	Visual Observation
Temperature	-	-	-	-	3 x Weekly	Grab
Total Lead	-	-	-	-	Twice Monthly	Grab
COD	-	-	-	-	Weekly	Grab

a. The pH shall not be less than 6.5 nor greater than 11.0. The pH shall be monitored as follows: three times weekly - Grab

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall not cause a film of oil floating on the surface of the receiving waters.

c. The discharge shall not contain oil or other substances in amounts sufficient to cause a visible film on the surface of the receiving waters.

d. Samples taken in compliance with the monitoring requirements shall be taken at the discharge point - Inflow 2100

\*Net is defined as the difference between intake and discharge values



Permit No. WI 0002381  
 Final Order No. \_\_\_\_\_  
 Page Three

### 3. Initial Effluent Limitations

During the period beginning upon the issuance of this permit and lasting until March 31, 1978, the permittee is authorized to discharge from outfall 001. Discharge shall be limited and monitored by the limitations specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day	Maximum	Average	Minimum	Frequency	Method
Flow M <sup>3</sup> /Day (MGD)	-	-	-	-	2 x Weekly	-
Total Suspended Solids	-	-	-	-	3 x Weekly	Grab
Ammonia (as N)	-	-	-	-	Weekly	Grab
Chlorides	-	-	-	-	3 x Weekly	Grab
Total Copper	-	8.6 (19)	-	0.2 mg/l	Twice Monthly	Grab
Total Iron	-	488 (106)	-	17 mg/l	Twice Monthly	Grab
Total Lead	-	14 (31)	-	0.5 mg/l	Twice Monthly	Grab
Total Chlorine Residual	-	-	-	35 mg/l	3 x Weekly	Grab
Oil & Grease	-	-	No visible film		Daily	Visual Observation
Temperature	-	-	-	-	2 x Weekly	Sampling

a. The pH shall not be less than 5.6 nor greater than 11.0. The pH shall be monitored at outfall three times per discharge.

b. The discharge shall not cause excessive flow in the receiving waters. The discharge shall be controlled to prevent excessive flow in the receiving waters.

c. The discharge shall not contain oil or other substances in amount sufficient to create a visible film which may be harmful to life.

d. Samples taken to comply with the monitoring requirements above shall be taken at outfall 001 and at three times per discharge.

\*Net is defined as the difference between intake and discharge values.

Permit No. VI 0002381  
 Final Order No. \_\_\_\_\_  
 Page Four

4. Initial Effluent Limitations - Treated Process Wastes

During the period beginning upon the issuance of this permit and lasting until March 31, 1978, the permittee is authorized to discharge treated process wastes from outfall 003. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day	Maximum	Minimum	Maximum	Frequency	Method
Flow M <sup>3</sup> /Day (MGD)	-	-	-	-	Weekly	-
Total Suspended Solids	600(1334) Net	900(2000) Net	100 mg/l Net	150 mg/l Net	3 x Weekly	Grab
COD	-	18,166(40,032)	-	3000 mg/l	Weekly	Grab
Ammonia (as N)	-	-	1.0 mg/l	1.5 mg/l	Weekly	Grab
Total Chlorine Residual	-	-	-	-	3 x Weekly	Grab
Chlorides	-	-	-	-	3 x Weekly	Grab
Temperature	-	-	-	-	3 x Weekly	Reading
Oil & Grease	-	-	No visible film		Daily	Visual Observation

a. The pH shall not be less than 6.5 nor greater than 12.5. The pH shall be monitored as follows: three times weekly.

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall be free of objectionable odors and floating solids.

c. The discharge shall not contain oil or other substances in amounts sufficient to create a visible film or stain on the receiving water.

d. Samples taken in compliance with the monitoring requirements above shall be taken prior to mixing with effluents from the Wichita - Wayne County Wastewater Treatment Plant.

\*Net is defined as the difference between intake and discharge values.

Permit No. VI 0002321  
 Final Order No. \_\_\_\_\_  
 Page Five

5. Initial Effluent Limitations - Total Chloride Loading

During the period beginning upon the issuance of this permit and lasting until March 31, 1978, the permittee is authorized to discharge from outfalls 001, 002, 003, & 005. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	kg/day	Maximum	Frequency	Method
<u>Total Combined outfalls 001, 002, 003 &amp; 005</u>				
Chlorides	-	227,000(500,000) Net Net	2 x Weekly	Calculation

\*Net is defined as the difference between intake and discharge values.

Permit No. NY 0002381  
 Final Order No. \_\_\_\_\_  
 Page Six

PART I

6. Initial Effluent Limitations

During the period beginning on the effective date of this permit and lasting until January 31, 1978, the discharge shall be subject to discharge from outfall 005. Such discharge shall be monitored and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	kg/day	mg/l	Frequency	Type
Flow, M <sup>3</sup> /Day (MGD)			3 x weekly	
BOD <sub>5</sub>			Weekly	24 hr composite
COD	2634(5805)	11183(24,603)	3 x weekly	24 hr composite
Total Suspended Solids		1118(2460) Net	3 x weekly	grab
Chlorides		4000(8000) Net	3 x weekly	24 hr composite
Phenol			3 x weekly	24 hr composite
Ammonia (as N)			3 x weekly	grab
Total Chlorine Residual			3 x weekly	grab
Oil & Grease		No Visible Film	Daily	Visual Observ.
Total Zinc			Twice Monthly	24 hr comp.
Temperature			Weekly	Reading
Sulfide			Twice Monthly	24 hr comp.

Net is defined as the difference between intake and discharge values.

a. The pH shall not be less than 3.0 nor greater than 11.0. The pH shall be monitored as follows: continuous monitoring.

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall be under all time of day and night.

c. Samples taken in compliance with the monitoring requirements above shall be taken at outfall 005 prior to discharge to Moravia Creek.

IT IS FURTHER ORDERED that the Company will treat, control, and monitor their wastewater discharge to the extent necessary to achieve and maintain the final limitations and conditions specified below:

# 9. FINAL EFFLUENT LIMITATIONS

During the period beginning October 1, 1977 and lasting until the expiration of this permit, the permittee is authorized to discharge barometric condenser water, floor wash water, and noncontact cooling water from outfall 002. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	kg/day (lb/day)	Maximum Limitations	Frequency	Method
Flow, M <sup>3</sup> /Day (MGD)			3 x weekly	
Chlorides			3 x weekly	24 hr composite
Oil & Grease		No Visible Film	3 x weekly	24 hr composite
Temperature			3 x weekly	24 hr composite
Total Suspended Solids*	844(1856)	1687(3711)	3 x weekly	24 hr composite
Ammonia (as N)		1.4 mg/l 2.3 mg/l	3 x weekly	24 hr composite
Total Chlorine Residual		1.0 mg/l 1.5 mg/l	3 x weekly	24 hr composite
Total Lead	0.6(1.37)	1.25(2.75)	Twice Monthly	24 hr composite

\* The above limitations for Total Suspended Solids may be modified to a Net value upon demonstration to the Chief Engineer of the Michigan Water Resources Commission that gross values are unobtainable due to separation or economic considerations. Such modification shall be made in accordance with Part II, Section A-1, of this permit.

The term noncontact cooling water shall mean water used for cooling which does not come into direct contact with any raw material, intermediate product, by product, waste product, or finished product.

a. The pH shall not be less than 6.5 nor greater than 9.5. The pH shall be monitored as follows: continuous monitoring daily maximum/minimum.

b. The discharge shall not cause offensive odor in the receiving waters. The discharge shall be kept at a minimum of one inch above the bottom of the receiving water.

c. The discharge shall not contain oil or other substances in amounts sufficient to create a visible film or stain on the receiving water.

d. Samples taken in accordance with the monitoring requirements above shall be taken at Outfall 002 prior to discharge to the receiving water.

e. In the event the permittee shall require the use of Water Treatment additives, the permittee shall notify the Michigan Water Resources Commission in accordance with the requirements of Part II, Section A-1.

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 Page Eight

# 10. Final Limitations

During the period beginning April 1, 1978 and lasting until the expiration of this permit, the permittee is authorized to discharge contact cooling water, process wastes, and non-contact cooling water from outfall 003. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day (lb/day)		Other Limitations		Frequency	Sample Type
	Average	Maximum	Average	Maximum		
Flow M <sup>3</sup> /Day (MGD)					3 x weekly	
Chlorides					3 x weekly	24 hr composite
Oil & Grease			No Visible Film		Daily	Visual Observ.
Temperature					Daily	Reading
Total Suspended Solids*	384(844)	768(1689)			5 x weekly	Grab
Ammonia (as N)			3 mg/l	5 mg/l	3 x weekly	24 hr composite
Total Copper				1.0 mg/l	Twice Weekly	24 hr composite
Total Lead	0.45(1.0)	0.9(2.0)			Twice monthly	24 hr composite
Total Iron*				1.6 mg/l	Weekly	24 hr composite
Chlorine Residual			1.0 mg/l	1.5 mg/l	Daily	Grab

\* The above limitations for Total Suspended Solids and Iron may be modified to a Net value upon demonstration to the Chief Engineer of the Michigan Water Resources Commission that gross values are unattainable due to technical or economic considerations. Such modification shall be made in accordance with Part II, Section B-4, herein.

The term noncontact cooling water means water used for cooling which does not come into direct contact with any raw material, intermediate product, by product, waste product, or finished product.

a. The pH shall not be less than 6.5 nor greater than 9.5. The pH shall be monitored as follows: continuous monitoring maximum 9 minimum 6.5.

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall be essentially free of float and objectionable solids.

c. The discharge shall not contain oil or other substances in amounts sufficient to create a visible oil or foam on the receiving waters.

d. Samples taken in compliance with the monitoring requirements above shall be taken prior to discharge to the Detroit River.

e. In the event the permittee shall require the use of Water Treatment additives, the permittee shall notify the Michigan Water Resources Commission in accordance with the requirements of Part II, Section A-1.

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# 11. Final Limitations

During the period beginning April 1, 1978 and lasting until the expiration of this permit, the permittee is authorized to discharge from outfall(s) 005. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day		Limits		Frequency	Type
	Average	Maximum	Average	Maximum		
Flow M <sup>3</sup> /Day (MGD)					Continuous	
Total Suspended Solids*	212(437)	423(884)	35 mg/l	70 mg/l	5 x Weekly	Grab
CO <sub>2</sub>		821(1801)			3 x Weekly	24 hr composite
Ammonia (as N)			1.0 mg/l	1.5 mg/l	3 x Weekly	24 hr composite
Total Chlorine Residual			1.0 mg/l	1.5 mg/l	Daily	Grab
Chlorides					3 x Weekly	24 hr composite
Total Lead	0.6(1.4)	1.2(2.7)	0.1 mg/l	0.2 mg/l	Twice Monthly	24 hr composite
Temperature					Daily	Reading
Oil & Grease			No Visible Film			

\* The above limitations for Total Suspended Solids may be modified to a net value upon demonstration to the Chief Engineer of the Michigan Water Resources Commission that gross values are unattainable due to peculiar or seasonal considerations. Such modification shall be made in accordance with Part 3, Section 246, hereon.

a. The pH shall not be less than 6.5 nor greater than 9.5. The pH shall be monitored as follows: continuous - nonstop daily maximum & minimum.

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall be essentially free of thick or any visible oil or grease.

c. The discharge shall not contain oil or other substances in amounts sufficient to create a visible film or stain on the bottom of the water.

d. Samples taken in compliance with the monitoring requirements above shall be taken prior to mixing with effluent from the Wardsville - Wayne County wastewater treatment plant, at Outfall 005.

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 Page Ten

2. Final Limitations (Revised May 21, 1976)

During the period beginning February 1, 1976 and lasting until the expiration of this permit, the permittee is authorized to discharge from outfall(s) 003. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day (lb/day)		Concentrations		Frequency	Sample Type
Average	Maximum	Average	Maximum			
Flow M <sup>3</sup> /Day (MGD)					3 x weekly	
BOD <sub>5</sub> *	173(380)	259(570)			3 x weekly	24 hr composite
COD					3 x weekly	24 hr composite
Total Suspended Solids	173(380)	259(570)			3 x weekly	24 hr composite
Chlorides			4000(8800)Net		3 x weekly	24 hr composite
Ammonia (as N)		114(250)	1.5 mg/l	3.0 mg/l	3 x weekly	Grab
Total Chlorine Residual				0.5 mg/l	3 x weekly	Grab
Phenol		4.5 (10)		0.2 mg/l	3 x weekly	24 hr composite
Sulfide					Weekly	24 hr composite
Temperature					3 x weekly	Reading
Oil & Grease			No Visual Film		Daily	Visual Observ.
Total Zinc				1.0 mg/l	Twice Monthly	24 hr composite

\* The above limitations for BOD may be modified to a Net value upon demonstration to the Chief Engineer of the Michigan Water Resources Commission that gross values are unattainable due to technical or economic considerations. Such modification shall be made in accordance with Part II, Section B-4 herein.

a. The pH shall not be less than 6.5 nor greater than 9.5. The pH shall be monitored as follows: Continuous automatic daily max. & min.

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall be essentially free of floating and insoluble solids.

c. The discharge shall not contain oil or other substances in amounts sufficient to create a visible film or sheen on the receiving water.

d. Samples taken in compliance with the monitoring requirements above shall be taken at outfall 003 prior to discharge to Menominee Creek.



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12. Final Effluent Limitations - Total Chloride Loading

During the period beginning April 1, 1976 and lasting until the date of expiration of this permit, the permittee is authorized to discharge from outfalls 001, 002, 003, & 005. Such discharge shall be limited and monitored by the permittee as specified below:

<u>Effluent</u> <u>Characteristic</u>	<u>kg/day</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>	
		<u>lb/day</u>		<u>Measurement</u>	<u>Sample</u>
		<u>Daily</u>	<u>Maximum</u>	<u>Frequency</u>	<u>Type</u>
<u>Total Combined outfalls 001, 002, 003 &amp; 005</u>					
Chlorides *	-	227,000(500,000)		3 Times Weekly	Calculation

\* The above limitations for chlorides may be modified to a Net value upon demonstration to the Chief Engineer of the Michigan Water Resources Commission that gross values are unattainable due to technical or economic considerations. Such modification shall be made in accordance with Part II, Section 9-4 herein.

IT IS FURTHER ORDERED that Part I-C Schedule of Compliance of NPDES Permit No. MI 0002381 issued June 20, 1975 is modified as follows:

C. SCHEDULE OF COMPLIANCE

Outfall 002

- a. Complete construction of said facilities on or before September 10, 1977.
- b. Attain operational level necessary to meet the limitations specified herein on or before October 1, 1977.

Outfalls 003 and 005

- a. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before September 30, 1977.
- b. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before October 31, 1977.
- c. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before November 30, 1977.
- d. Complete construction of said facilities on or before December 31, 1977.
- e. Attain operational level necessary to meet the limitations specified herein on or before April 1, 1978.

Outfall 006

- a. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before September 30, 1977.
- b. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before October 31, 1977.
- c. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before November 30, 1977.
- d. Complete construction of said facilities on or before December 31, 1977.
- e. Attain operational level necessary to meet the limitations specified herein on or before February 1, 1978.

No later than 14 calendar days following a date identified in the above schedule of compliance, the Company shall submit either a report of progress, or in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case the notice shall include the cause of noncompliance, any remedial actions taken and the probability of meeting the next scheduled requirement. As to any interim date set forth herein the Chief of the Water Quality Division of the Department of Natural Resources may extend compliance, for good cause shown, for up to 90 days without necessity of the approval of the Water Resources Commission.

IT IS THEREFORE ORDERED that this Final Order will take effect on \_\_\_\_\_, 1977, and shall be effective until May 30, 1980.

IT IS FURTHER ORDERED that Part I-C Schedule of Compliance of NPDES Permit No. MI 0002381 issued June 20, 1975 is modified as follows:

C. SCHEDULE OF COMPLIANCE

Outfall 002

- a. Complete construction of said facilities on or before September 10, 1977.
- b. Attain operational level necessary to meet the limitations specified herein on or before October 1, 1977.

Outfalls 003 and 005

- a. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before September 30, 1977.
- b. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before October 31, 1977.
- c. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before November 30, 1977.
- d. Complete construction of said facilities on or before December 31, 1977.
- e. Attain operational level necessary to meet the limitations specified herein on or before April 1, 1978.

Outfall 006

- a. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before September 30, 1977.
- b. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before October 31, 1977.
- c. Submit progress report to the Chief of the Water Quality Division specifying the status of construction on or before November 30, 1977.
- d. Complete construction of said facilities on or before December 31, 1977.
- e. Attain operational level necessary to meet the limitations specified herein on or before February 1, 1978.

No later than 14 calendar days following a date identified in the above schedule of compliance, the Company shall submit either a report of progress, or in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case the notice shall include the cause of noncompliance, any remedial actions taken and the probability of meeting the next scheduled requirement. As to any interim date set forth herein the Chief of the Water Quality Division of the Department of Natural Resources may extend compliance, for good cause shown, for up to 90 days without necessity of the approval of the Water Resources Commission.

IT IS THEREFORE ORDERED that this Final Order will take effect on 1977, and shall be effective until May 30, 1980.

The Pennwalt Corporation is hereby put on notice that but for this Final Order, the Company might be subject to the Civil Penalty provisions provided by law for failure of the Company to be in full compliance by the mandated July 1, 1977, date. The Pennwalt Corporation and the Department of Natural Resources hereby agree that the Company shall forthwith pay as liquidated damages the sum of One Hundred and Fifty Thousand Dollars (\$150,000) to the General Fund of the State of Michigan. In addition to the above amounts, the Company agrees to pay the following liquidated damages:

- a. For those days beyond September 30, 1977 that the discharge from Outfall 002 is in violation of the Final Effluent Limitations for Outfall 002 specified herein: Two Thousand Dollars (\$2,000) per day.

Beginning November 15, 1977, and on the fifteenth day of each month thereafter (through January 15, 1978) the Company shall notify the Department of Natural Resources in writing of each day of the preceding calendar month for which the \$2,000 is payable under this subsection of this Order. The Company shall contemporaneously pay such amounts (if any) then accrued to the State.

- b. For those days beyond December 31, 1977 during which the discharges from Outfalls 003 and 005 are not treated by waste treatment facilities installed in accordance with approved plans specified in Schedule of Compliance C-2, herein: Two Thousand Dollars (\$2,000) per day. There shall be no payments required under this subsection for days during which there is no discharge, nor when final effluent limits are achieved.

Beginning February 15, 1978, and on the fifteenth day of each month thereafter (through July 15, 1978) the Company shall notify the Department of Natural Resources in writing of each day of the preceding calendar month for which the \$2,000 is payable under this subsection of this Order. The Company shall contemporaneously pay such amounts (if any) then accrued to the State.

- c. For those days beyond March 31, 1978 that the discharges from Outfalls 003 and 005 are in violation of the Final Effluent Limitations specified for said outfalls: Two Thousand Dollars (\$2,000) per day.

Beginning May 15, 1978, and on the fifteenth day of each month thereafter (through July 15, 1978) the Company shall notify the Department of Natural Resources in writing of each day of the preceding calendar month for which the \$2,000 is payable under this subsection of this Order. The Company shall contemporaneously pay such amounts (if any) then accrued to the State.

A violation of the final effluent limitations for Outfall 002 after January 1, 1978, or for Outfall 006 after February 1, 1978, or for Outfalls 003 and 005 after July 1, 1978 is a violation of this Final Order.

The State may seek other and further relief for noncompliance conducted after any final compliance date specified in this Order.

Pennwalt Corporation is hereby put upon notice by the Commission that any material failure to comply with this Final Order may, and probably will, result in prompt enforcement action. A violation of any date in any of the schedules of compliance specified herein is a violation of the total Order. Nothing in this Order is, however, intended to or shall deprive Pennwalt Corporation of its right or privilege to petition the Water Resources Commission or such other authority as may be appropriate for review of any such violation.

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Page Fourteen

This Final Order entered on \_\_\_\_\_ by direction of the Michigan  
Water Resources Commission and the Director of the Department of Natural Resources.  
The Commission and the Department retain jurisdiction to modify this Order or  
enter such further Orders as the facts and circumstances may warrant.

\_\_\_\_\_  
Chairman

Approved as to Form and Substance:

Pennwalt Corporation

by: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Approved as to Substance:

\_\_\_\_\_  
Robert J. Courchaine  
Chief, Water Quality Division

Dated: \_\_\_\_\_

Approved as to Form:

Frank J. Kelley  
Attorney General

\_\_\_\_\_  
Stewart H. Freeman  
Assistant Attorney General

Dated: \_\_\_\_\_

Approved for Entry:

Michigan Department of Natural Resources

\_\_\_\_\_  
Howard A. Tanner  
Director









CUSTODY  
NON-CUSTODY

Final Time



CUSTODY  
NON-CUSTODY

Final Time







ATTACHMENT II  
RCRA FACILITY INVESTIGATION  
WEST PLANT

RCRA CORRECTIVE ACTION PLAN  
PENNWALT CORPORATION  
MID 005 363 114

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)  
AT  
PENNWALT CORPORATION  
WEST PLANT

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the West Plant, as identified in the Status column (Column D) of Table One of this Scope of Work, and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation at Pennwalt Corporation, Wyandotte, Michigan.

SCOPE

The RCRA Facility Investigation consists of six tasks:

Task I: Description of Current Conditions

- A. West Plant Background
- B. Nature and Extent of Contamination

Task II: Pre-Investigation Evaluation of Potential Corrective Measure Technologies

Task III: RFI Workplan Requirements

RFI Phase I

- A. Environmental Setting Characterization Plan
- B. Source Characterization Plan
- C. Potential Receptor Identification Plan
- D. Project Management Plan
- E. Data Collection Quality Assurance Plan
- F. Data Management Plan
- G. Health and Safety Plan
- H. Community Relations Plan

RFI Phase II

Contamination Characterization Plan

Task IV: West Plant Investigation



**Task V: Investigation Analysis (Draft RFI Reports)**

- A. Data Analysis
- B. Protection Standards

**Task VI: Reports**

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

## TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for U.S. EPA approval a report providing the background information pertinent to the West Plant and contamination as set forth below. The data gathered during previous investigations or inspections and other relevant data shall be included.

### A. West Plant Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general West Plant physiography, hydrogeology, and historical use of the West Plant for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:
  - a. General geographic location;
  - b. Property lines, with the owners of all adjacent property clearly indicated;
  - c. Topography and surface drainage (with a contour interval of 5 feet and a scale of 1 inch = 200 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface water containment areas;

- d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
- e. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;
- f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
- g. All known past and present product and waste underground tanks or piping;
- h. Surrounding land uses (residential, commercial, agricultural, recreational); and
- i. The location of all production and ground water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

2. To the extent available from diligent inquiry, a history and description of ownership and operation, including former tenant operations, and associated solid and hazardous waste generation, treatment, storage and disposal activities at the West Plant including a list of raw materials, products used, by-products generated and location of production areas;
3. To the extent available from diligent inquiry, approximate dates or periods of past product and waste spills of hazardous waste or Appendix IX hazardous constituents including, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and
4. A summary of past environmental permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the West Plant with respect to these environmental permits.

B. Nature and Extent of Contamination

The Respondent shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This should include all units and areas identified in the Status column of Table One of this Scope of Work. For each area, the Respondent shall identify the following:
  - a. Location of unit/area (which shall be depicted on a facility map);
  - b. Quantities of solid and hazardous wastes, to the extent known;
  - c. Hazardous waste or constituents, to the extent known; and
  - d. Identification of areas where additional information may be necessary.
2. The Respondent shall prepare a preliminary assessment and description of the existing degree and extent of contamination. This should include:
  - a. Available monitoring data and qualitative information on locations and levels of contamination at the West Plant;
  - b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

- c. The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

TASK II: PRE-INVESTIGATION EVALUATION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES

In accordance with the Schedule, the Respondent shall submit to U.S. EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the West Plant investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

The RFI Workplan will be implemented in three phases. The focus of the first phase, "RFI Phase I," involves an investigation of the environmental setting, source characterization and a study to identify potential receptors which could be impacted by the contamination, if any, at the West Plant.

The second phase, "RFI Phase II," will be implemented after RFI Phase I has been completed. The RFI Phase II will consist of the contaminant characterization.

The third phase, "RFI Phase III," will be implemented, if necessary, after RFI Phases I & II have been completed. RFI Phase III will consist of a focused

investigation of the creek in the vicinity of the West Plant, if necessary, depending upon the results of the RFI Phases I & II.

Subject to the provisions of Paragraphs XII and XIX of the Consent Order, the RFI Phase III may also consist of a focused investigation of areas beyond the West Plant boundary, to the extent required by RCRA, if a final determination is made based on the RFI Phase II results that: 1) there has been a beyond boundary release of hazardous wastes or hazardous constituents from the West Plant; 2) beyond boundary corrective action may be necessary to protect human health and the environment; and 3) pursuant to Paragraph VIII(16) of the Consent Order, additional work is necessary.

Respondent will implement RFI Phases I and II and, if necessary, RFI Phase III in accordance with Task IV of this Scope of Work.

#### RFI Phase I

The Respondent shall prepare and submit to EPA for approval a RCRA Facility Investigation (RFI) Workplan I within the time period specified in the schedule included herein ("Schedule"). This RFI Workplan I shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the West Plant specific situation. The RFI Workplan I shall describe how the Respondent will conduct the following:



A. Environmental Setting Plan

The Respondent shall develop a plan to collect information to supplement and verify the existing information on the environmental setting at the West Plant. The plan shall include the following tasks:

1. Hydrogeology

The Respondent shall develop a plan to evaluate hydrogeologic conditions at the West Plant:

a. A description of the regional and West Plant specific geologic and hydrogeologic characteristics affecting ground water flow beneath the West Plant, including:

- 1) Regional and West Plant specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
- 11) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
- 111) Depositional history;

- iv) Identification and characterization of areas and amounts of recharge and discharge;
  - v) Regional and West Plant specific ground water flow patterns;
  - vi) Characterize seasonal variations in the ground water flow regime; and
  - vii) Initial screening of groundwater quality at the West Plant based on Appendix IX constituents and waste stream specific hazardous constituents, to develop information to support a target constituent list (constituents of interest) for Phase II work.
- b. An analysis of any topographic features that might influence the ground water flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis).
- c. Based on field data, test, and cores, a representative and accurate classification and description of all hydrogeologic units which may be part of the migration pathways at the West Plant (i.e., the aquifers and any intervening saturated and unsaturated units), including:

- i) Hydraulic conductivity and porosity (total and effective);
  - ii) Lithology, grain size, sorting, degree of cementation;
  - iii) An interpretation of hydraulic interconnections between saturated zones; and
  - iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).
- d. Based on field studies, cores, and structural geology, construct hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units, including bedrock, which may be part of the migration pathways identifying:
- i) All sand and gravel deposits in consolidated deposits;
  - ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
  - iii) Zones of high permeability or low permeability that might direct and restrict the flow of contaminants;

- iv) Any aquifer: confined or unconfined, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and
  - v) Water bearing zones that may serve as a pathway for contaminant migration including perched zones of saturation.
- e. Based on data obtained from ground water monitoring wells and piezometers installed at the West Plant, a representative description of water level or fluid pressure monitoring including:
  - i) Water level contour and/or potentiometric maps;
  - ii) Hydrologic cross sections showing vertical gradients;
  - iii) The flow system, including the vertical and horizontal components of flow; and
  - iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.
- f. A description of man made influences that may affect the hydrogeology of the site, identifying:

- i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
- ii) Man made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

## 2. Soils

The Respondent shall develop a plan to characterize the soil units above the water table at the West Plant. Such characterization shall include but not be limited to, the following information:

- a. SCS soil classification;
- b. Surface soil distribution;
- c. Soil profile, including ASTM classification of soils;
- d. Transects of soil stratigraphy;
- e. Hydraulic conductivity (saturated and unsaturated);
- f. Relative permeability;
- g. Bulk density;

- h. Porosity;
- i. Soil sorptive capacity;
- j. Cation exchange capacity (CEC);
- k. Soil organic content;
- l. Soil pH;
- m. Particle size distribution;
- n. Depth of water table;
- o. Moisture content;
- p. Effect of stratification on unsaturated flow;
- q. Infiltration;
- r. Evapotranspiration;
- s. Storage capacity;
- t. Vertical flow rate;

- u. Mineral content; and
- v. Initial screening of soil quality based on Appendix IX constituents and waste stream specific hazardous constituents, to develop information to support a target constituent list (constituents of interest) for Phase II work.

### 3. Surface Impoundments and Sediment

The Respondent shall develop a plan to characterize the surface impoundments at the West Plant. Such characterization shall include, but not be limited to, the following activities and information:

- a. Description of the surface impoundments including:
  - 1) Location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment.
- b. Description of the chemistry of the water and sediments in the surface impoundments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ), chemical oxygen demand, total organic carbon, and initial screening of surface impoundment sediment and water quality based on Appendix IX constituents and waste stream specific hazardous constituents, to develop information to support a target constituent list (constituents

of interest) for Phase II work.

c. Description of sediment characteristics including:

- i) Depositional area;
- ii) Thickness profile; and
- iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity and pH).

4. Air

The Respondent shall develop a plan to provide information characterizing the climate in the vicinity of the West Plant. Such information shall include, but not be limited to:

a. A description of the following parameters:

- i) Annual and monthly rainfall averages;
- ii) Monthly temperature averages and extremes;
- iii) Wind speed and direction;



- iv) Relative humidity/dew point;
  - v) Atmospheric pressure;
  - vi) Evaporation data;
  - vii) Development of inversion; and
  - viii) Climate extremes that have been known to occur in the vicinity of the West Plant, including frequency of occurrence.
- b. A description of topographic and man made features which affect air flow and emission patterns, including:
- i) Ridges, hills or mountain areas;
  - ii) Canyons or valleys;
  - iii) Surface water bodies (e.g., rivers, lakes, bays, etc.);
  - iv) Wind breaks and forests; and
  - v) Buildings.

**B. Source Characterization Plan**

The Respondent shall develop a plan to collect analytical data for waste characterization in the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and West Plant characteristics affecting release (e.g., West Plant security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

**1. Unit/Disposal Area Characteristics:**

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;
- c. Design features;
- d. Operating practices (past and present);
- e. Period of operation;
- f. Age of unit/disposal area;
- g. General physical conditions; and

h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

- vii) Density;
- viii) Boiling point;
- ix) Viscosity;
- x) Solubility in water;
- xi) Cohesiveness of the waste;
- xii) Vapor pressure; and
- xiii) Flash point.

c. Migration and dispersal characteristics of the waste;

- i) Sorption;
- ii) Biodegradability, bioconcentration, biotransformation;
- iii) Photodegradation rates;
- iv) Hydrolysis rates; and
- v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. Potential Receptor Identification Plan

The Respondent shall develop a plan to collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the West Plant. The plan will also require a literature search and review of relevant existing data on the chemical analysis of biological data and on observable effects in ecosystems. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:
  - a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
  - b. Location of ground water users including wells and discharge areas within a one mile radius of the West Plant.
2. Local uses and possible future uses of surface waters draining the West Plant:
  - a. Domestic and municipal (e.g., potable and lawn/garden watering);
  - b. Recreational (e.g., swimming, fishing);

- c. Agricultural;
  - d. Industrial; and
  - e. Environmental (e.g., fish and wildlife propagation).
3. Human use of or access to the West Plant and adjacent lands, including but not limited to:
- a. Recreation;
  - b. Hunting;
  - c. Residential;
  - d. Commercial;
  - e. Zoning; and
  - f. Relationship between population locations and prevailing wind direction.
4. A description of the biota in surface water bodies on, adjacent to, or affected by the West Plant.
5. A description of the ecology overlying and adjacent to the facility.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
7. A description of any endangered or threatened species near the facility.

D. Project Management Plan

The Respondent shall modify to the extent necessary the East Plant Project Management Plan which will include discussion of the technical approach, schedules, budget, and personnel for the West Plant RFI. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the West Plant RCRA Facility Investigation.

E. Data Collection Quality Assurance Plan

The Respondent shall modify, to the extent necessary, the East Plant Quality Assurance Plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during the West Plant investigation to characterize the environmental setting, source, and contamination. The plan is intended to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

## **1. Data Collection Strategy**

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

- a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;**
- b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;**
- c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:**
  - i) Environmental conditions at the time of sampling;**
  - ii) Number of sampling points;**
  - iii) Representativeness of selected media; and**
  - iv) Representativeness of selected analytical parameters.**



d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

- i) RFI data generated by the Owner/Operator over some time period;
- ii) RFI data generated by an outside laboratory or consultant versus data generated by the Owner/ Operator;
- iii) Data generated by separated consultants or laboratories; and
- iv) Data generated by an outside consultant or laboratory over some time period.

e. A description of frequency of monitoring and information to be provided in quality assurance reports. The reports should include but not limited to:

- i) Periodic assessment of measurement data accuracy, precision, and completeness;
- ii) Results of performance audits;
- iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

## 2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss the following:

- a. Selecting appropriate sampling locations, depths, etc.;
- b. Providing a statistically sufficient number of sampling sites;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which sampling should be conducted;
- e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of sampling and length of sampling period;

- h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- i. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- j. Documenting field sampling operations and procedures, including:
  - i) Documentation of procedure for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
  - ii) Procedure and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation method;
  - iv) Calibration of field devices;
  - v) Collection of replicate samples;
  - vi) Submission of field-biased blanks, where appropriate;
  - vii) Potential interferences present at the facility;

viii) Construction materials and techniques, associated with monitoring wells and piezometers;

ix) Sampling order; and

x) Decontamination procedures.

k. Selecting appropriate sample containers;

l. Sample preservation; and

m. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

### 3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

- b. Providing a statistically sufficient number of field measurements;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which field measurement should be conducted;
- e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of field measurement and length of field measurement period; and
- h. Documenting field measurement operations and procedures, including:
  - i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;
  - ii) Calibration of field devices;
  - iii) Collection of replicate measurements;

- iv) Submission of field-biased blanks, where appropriate;
- v) Potential interferences present at the facility;
- vi) Construction materials and techniques associated with monitoring wells and piezometers use to collect field data;
- vii) Field equipment listing;
- viii) Order in which field measurements were made; and
- ix) Decontamination procedures.

#### 4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

##### a. Chain-of-custody procedures, including:

- 1) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

- ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
  - iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.
- b. Sample storage procedures and storage times;
- c. Sample preparation methods;
- d. Analytical procedures, including:
  - i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology; and
  - v) Method detection of limits.
- e. Calibration procedures and frequency;

- f. Data reduction, validation and reporting;
- g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
  - i) Method blank(s);
  - ii) Laboratory control sample(s);
  - iii) Calibration check sample(s);
  - iv) Replicate sample(s);
  - v) Matrix-spiked sample(s);
  - vi) "Blind" quality control sample(s);
  - vii) Control charts;
  - viii) Surrogate samples;
  - ix) Zero and span gases; and
  - x) Reagent quality control checks.



A performance audit will be conducted by U.S. EPA on the laboratories selected by the Respondent. This audit must be completed and approved prior to the approval of the Quality Assurance Procedure Plan (QAPP) for the West Plant.

- h. Preventive maintenance procedures and schedules;
- i. Corrective action (for laboratory problems); and
- j. Turnaround time.

F. Data Management Plan

The Respondent shall modify, to the extent necessary, the East Plant Data Management Plan a Data Management Plan to document and track West Plant investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;

- b. Sampling or field measurement location and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measured; and
- f. Result of analysis (e.g., concentration).

## 2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis;
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

### 3. Graphical Displays

Both historical data and data required as part of this RFI shall be presented in generally accepted formats for ease of interpretation. The data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc). The application of graphical displays shall be used to:

- a. Display sampling location and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data are required;
- c. Display levels of contamination at each sampling location;
- d. Display geographical extent of contamination;
- e. Display contamination levels, averages, and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- g. Indicate features affecting intramedia transport and show potential receptors.

G. Health and Safety Plan

The Respondent shall modify, to the extent necessary, the East Plant Health and Safety Plan.

RFI Phase I

1. Major elements of the Health and Safety Plan shall include:
  - a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted including, but not limited to, on and off-site exposure to contaminants during the implementation of interim measures at the facility;
  - c. list key personnel and alternates responsible for site safety, response operations, and for protection of public health;
  - d. Delineate work area;
  - e. Describe levels of protection to be worn by personnel in work area;
  - f. Establish procedures to control site access;

- g. Describe decontamination procedures for personnel and equipment;
  - h. Establish site emergency procedures;
  - i. Address emergency medical care for injuries and toxicological problems;
  - j. Describe requirements for an environmental surveillance program;
  - k. Specify any routine and special training required for responders; and
  - l. Establish procedures for protecting workers from weather-related problems.
2. The Facility Health and Safety Plan shall be consistent with:
- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
  - b. U.S. EPA Order 1440.1 - Respiratory Protection;
  - c. U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
  - d. Facility Contingency Plan;

- e. U.S. EPA Standard Operating Safety Guide (1984);
- f. OSHA regulations particularly in 29 CFR 1910 (as amended on December 19, 1986) and 1926;
- g. State and local regulations; and
- h. Other U.S. EPA guidance as provided.

#### H. Community Relations Plan

The Respondent shall modify, to the extent necessary, the East Plant Community Relations Plan for the dissemination of information to the public regarding West Plant investigation activities and results.

#### RFI Phase II

Respondent shall prepare and submit to U.S. EPA for approval an RFI Phase II Workplan within the time period specified in the Schedule. The focus of the RFI Phase II Workplan will be on contaminant characterization and will be based upon the data obtained in the final RFI Phase I Report.

#### Contamination Characterization Plan

The Respondent shall develop a plan to collect analytical data on ground water, soils and surface impoundments at the the West Plant. This data

shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the West Plant:

1. Ground Water Contamination

The Respondent shall develop a ground water investigation plan to characterize any plumes of contamination at the West Plant with respect to those constituents of interest identified in the RFI Phase I. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the West Plant;
- b. The horizontal and vertical direction of contamination movement;
- c. The velocity of contaminant movement;
- d. The horizontal and vertical concentration profiles of constituents of interest, which are identified in the RFI Phase I, in the plume(s);

- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

## 2. Soil Contamination

The Respondent shall develop a plan to characterize the contamination of the soil fill above the water table in the vicinity of the contaminant release with respect to those constituents of interest identified in the RFI Phase I. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination;
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;



- c. Specific contaminant concentrations;
- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement; and

The Respondent shall document the procedures used in making the above determinations.

### 3. Surface Impoundments and Sediment Contamination

The Respondent shall develop a surface impoundment investigation plan to characterize contamination in surface impoundments with respect to those constituents of interest identified in the RFI Phase I.

The investigation shall include, but not be limited to, the following information:

- a. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations.
- b. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the impoundments;

- c. The horizontal and vertical direction of contaminant movement;
- d. The contaminant velocity;
- e. An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- f. An extrapolation of future contaminant movement; and

The Respondent shall document the procedures used in making the above determinations.

#### 4. Air Contamination

The Respondent shall develop an air contamination investigation plan to characterize the particulate and gaseous contaminants released to the atmosphere from the units and other source areas identified in the Status column of Table One, or document why there is no need to conduct an investigation. This investigation, if required, shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of the release; and

- c. The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

The Respondent shall document the procedures used in making the above determinations.

#### 5. Subsurface Gas Contamination

The Respondent shall develop a plan to characterize subsurface gases in the groundwater emitted from buried hazardous waste and hazardous constituents from the units and other source areas identified in the Status column of Table One, or document why there is no need to conduct an investigation. This investigation, if required, shall include the following information:

- a. A description of the horizontal and vertical extent of subsurface gases mitigation;
- b. The chemical composition of the gases being emitted;
- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

### RFI Phase III

Based upon the results and recommendations provided by Respondent in the Final RFI Phase I and II Reports, a determination will be made as to the need for an RFI Phase III focusing on the creek in the vicinity of the West Plant. U.S. EPA will provide written notice of the determination to Respondent. Within 90 days after receipt of a determination that an RFI Phase III is needed, Respondent shall submit an RFI Phase III Workplan. The focus of the RFI Phase III, if required, will be to characterize the creek water and sediments in the vicinity of the West Plant for specific contaminants of interest, if any, identified in U.S. EPA's written determination of the need for an RFI Phase III, based on the information presented in the RFI Phase II Final Report.

RFI Workplan III shall describe how the Respondent will conduct the following:

#### A. Environmental Setting Plan

To supplement the Environmental Setting program established during RFI Phases I and II, the Respondent shall develop a plan to characterize the surface water in the vicinity of the West Plant. Such characterization shall include the following activities and information:

1. A description including:
  - a. Location elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies;
  - b. Drainage patterns; and
  - c. Evapotranspiration.
2. A description of the chemistry of the water and sediments in the creek within the vicinity of the West Plant. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ), chemical oxygen demand, total organic carbon, specific contaminant concentrations.
3. A description of sediment characteristics within the vicinity of the West Plant including:
  - a. Deposition area;
  - b. Thickness profile; and
  - c. Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity and pH)

B. Contamination Characterization Plan

The scope of this program will be contingent upon the findings of the RFI Phases I and II. The Respondent shall develop a plan to collect analytical data on water and sediment of the creek in the vicinity of the West Plant. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminants of interest, if any, identified in the RFI Phases I and II as potentially affecting the water and sediment of the creek in the vicinity of the West Plant. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of all individuals performing the sampling and analysis.

C. Potential Receptor Identification Plan

The Respondent shall modify, if necessary, the plan established for RFI Phase I to reflect the activities of RFI Workplan II.

D. Data Collection Quality Assurance Plan

The Respondent shall modify, if necessary, guidelines established for this plan in RFI Phase I(F).

E. Data Management Plan

The Respondent shall modify, if necessary, guidelines established for this plan in RFI Phase I(G).

F. Project Management Plan, Health and Safety Plan, Community Relations Plan

The Respondent shall modify, if necessary, plans established for RFI Phase I to reflect the activities of RFI Workplan II.

#### TASK IV: FACILITY INVESTIGATION

Upon notice of EPA approval, the Respondent shall implement RFI Workplan I, RFI Workplan II, and subsequent RFI Workplan III, if required, pursuant to the approved schedules therein which set forth those investigations necessary to: characterize the West Plant (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analysis shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.



## TASK V: INVESTIGATION ANALYSIS

The Respondent shall prepare and submit to EPA, in accordance with the Schedule herein, a draft RFI Report for Phases I and II, and, if necessary, a subsequent draft RFI Report for Phase III, that shall contain an analysis and summary of all West Plant investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

### A. Data Analysis

The Respondent shall analyze all West Plant investigation data obtained in Task IV and the previous studies and prepare a report(s) on the type and extent of contamination at the West Plant including sources and migration pathways. The report(s) shall describe the extent of contamination, (qualitative/quantitative) in relation to background levels indicative for the area identify the applicable health and environmental criteria and assess the potential threat to human health and the environment. U.S. EPA will use the report(s) to determine the need for Corrective Measures with respect to each Solid Waste Management Unit ("SWMU") and other potential source area studied in the RFI. Pursuant to Paragraph VIII(7) of this Order, U.S. EPA shall make preliminary written determination as to the need for a CMS, identifying which SWMU's require corrective action and shall submit a copy of the preliminary determination to Respondent.

B. Protection Standards

1. Ground Water Protection Standards

The Respondent shall provide information to support the Agency's selection/development of Ground Water Protection Standards for all of the constituents of interest found in the ground water during the Facility Investigation (Task IV).

a. The Ground Water Protection Standards shall consist of:

- i) for any constituents listed in Table 1 of 40 CFR 264.94, the respective value given in the table (MCL) if the background level of the constituent is below the given in Table 1; or
- ii) the background level of that constituent in the ground water; or
- iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by the Respondent in accordance with U.S. EPA guidance. For any proposed ACL's the Respondent shall include a justification based upon the criteria set forth in 40 CFR 264.94.

- c. The U.S. EPA shall notify the Respondent in writing of approval, disapproval or modifications, at any proposed ACL, the notice shall include the reason(s) for any disapproval or modification; and
- d. Within thirty (30) days of receipt of the U.S. EPA's notification of disapproval of any proposed ACL, the Respondent shall amend and submit revisions to the U.S. EPA.

## 2. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

## TASK VI: REPORTS

### A. Preliminary and Workplan

The Respondent shall submit to the U.S. EPA reports on Task I and II and the RCRA Facility Investigation Workplans (Task III). in accordance with the schedule.

### B. Progress

The Respondent shall at a minimum provide the U.S. EPA with signed, bimonthly progress reports containing the following information with respect to the RFI program:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, and summaries of laboratory/monitoring data.

C. Draft and Final

Upon U.S. EPA approval, the Respondent shall prepare the West Plant RCRA Facility Investigation Phase I and Phase II, and, if necessary, Phase III, Report(s) to present Tasks IV-V. The RCRA Facility Investigation Report(s) shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Report(s) shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report(s).

Five (5) copies of all reports, including the Task I report, Task II report, Task III workplan(s), and both the Draft and Final RCRA Facility Investigation Phase I, Phase II, and, if necessary, Phase III, Reports (Task IV-V) shall be provided by the Respondent to U.S. EPA.

### West Plant Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

WEST PLANT SUBMISSION	DUE DATE *
TASK I: DESCRIPTION OF CURRENT CONDITIONS	WITHIN 240 DAYS OF EFFECTIVE DATE OF ORDER
TASK II: PRE-INVESTIGATION EVALUATION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES	WITHIN 420 DAYS OF EFFECTIVE DATE OF ORDER
TASK III: RFI WORKPLAN I	WITHIN 420 DAYS OF EFFECTIVE DATE OF ORDER
TASK IV: IMPLEMENTATION OF APPROVED RFI WORKPLAN I	IN ACCORDANCE WITH THE SCHEDULE IN THE APPROVED RFI WORKPLAN I
TASK III: RFI WORKPLAN II	WITHIN 90 DAYS OF RECEIPT OF U.S. EPA WRITTEN APPROVAL OF FINAL RFI REPORT I
TASK III: RFI WORKPLAN III	WITHIN 90 DAYS OF U.S. NOTICE TO IMPLEMENT
TASK IV: IMPLEMENTATION OF APPROVED RFI WORKPLAN II AND RFI WORKPLAN III	IN ACCORDANCE WITH THE SCHEDULES IN THE APPROVED RFI WORKPLANS II AND III

<sup>1</sup>As finalized pursuant to Paragraph XIX of this Order.

\*All due dates are calculated from the effective date of this Order unless otherwise specified.

WEST PLANT SUBMISSION	DUE DATE *
TASK V: DRAFT RFI REPORT I	IN ACCORDANCE WITH SCHEDULE IN THE APPROVED RFI WORKPLAN I
TASK V: FINAL RFI REPORT I	WITHIN 60 DAYS OF RECEIPT OF U.S. EPA COMMENTS <sup>1</sup> ON DRAFT RFI REPORT I
TASK V: DRAFT RFI REPORT II DRAFT RFI REPORT III	IN ACCORDANCE WITH SCHEDULE IN RFI WORKPLANS
TASK V: FINAL RFI REPORT II FINAL RFI REPORT III	WITHIN 60 DAYS OF RECEIPT OF U.S. EPA COMMENTS <sup>1</sup> ON RFI REPORT
TASK VI: PROGRESS REPORTS ON TASKS I THROUGH VI	BIMONTHLY BY THE 15TH DAY OF THE MONTH FOLLOWING THE COMPLETED REPORTING PERIOD

<sup>1</sup>As finalized pursuant to Paragraph XIX of this Order.

\*All due dates are calculated from the effective date of this Order unless otherwise specified.

WEST PLANT SCOPE OF WORK

TABLE ONE

Solid Waste Management Units  
And Other Source Areas

<u>A.</u> <u>Identification</u>	<u>B.</u> <u>Description</u>	<u>C.</u> <u>Contents</u>	<u>D.</u> <u>Status*</u>
1) Drum Storage Area	Concrete pad with concrete curb and sump	Containers of hazardous waste stored on pallets	Not included
2) Storage Tanks (Currently undergoing RCRA clean closure)	9 tanks; Tanks 470 and 471 have earthen berms; all others surrounded by concrete walls	Tanks 470 and 471 contain organic, oily waste; corrosive, ignitable	Not included
		Tank 934 contains water-DEHA mixture; ignitable	Not included
		Tank 1202 contains still bottoms of crude amyl phenol; corrosive	Not included
		Tanks 450 and 2233 contain waste hydrochloric waste; corrosive	Not included
		Tank 3876 contains filtrate from production of Endothall® corrosive	Not included
		Tank 21444 contains bulk waste alkyl and alkyl-anol amine azeotrope; ignitable and corrosive	Not included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.



<u>A. Identification</u>	<u>B. Description</u>	<u>C. Contents</u>	<u>D. Status*</u>
		Tank 46313 contains mixture of sodium hydroxide and sodium hypochlorite; corrosive and reactive.	Not included
3) Tank 1224	Tank and associated sump; indoor	Initial still overheads; corrosive	Not included
4) NPDES Surface Impoundments (a.k.a. Ponds 1, 2, 3 and 4)	4 surface impoundments	Associated with Outfall 006 (renamed Outfall 001); process waste waters	Included
5) Former Landfill A	Landfill	Bulk amyl phenol-clay filter cake, empty containers	Included
6) Former Landfill B	Landfill	Bulk amyl phenol-clay filter cake	Included
7) Former Landfill D	Landfill	Bulk amyl phenol-clay filter cake	Included
8) Former Surface Impoundment 6	Surface impoundment	Solids from other surface impoundments	Included
9) Other Former Surface Impoundments	2 surface impoundments	Unclassified solids and liquids; closed	Included
10) Empty Drum Storage Area	50' x 180' area	Empty containers	Included
11) Tank No. 195.2.2	Tank	Pond skimmings from Pond 4	Included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

	<u>A.</u> <u>Identification</u>	<u>B.</u> <u>Description</u>	<u>C.</u> <u>Contents</u>	<u>D.</u> <u>Status*</u>
12)	Tank No. 195.2.1	Tank	Pond skimmings from Pond 2	Included
13)	NPDES Neutralization Tank	Tank, concrete and steel	Associated with Outfall 006 (renamed Outfall 001); plant waste water	Included; limited soil borings and analytical screening near tank
14)	Reject Liquor Tank (relocated from East Plant)	100,000 gal. tank, rubber lined	Product HCl	Not included
15)	Mobile Tank Trailers	2 mobile trailers used to trans- port wastes within the plant	Hazardous wastes	Loading areas included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

MAC/15737/0037/AD2/7

ATTACHMENT III  
RCRA FACILITY INVESTIGATION  
WEST BRINE FIELD AREA

RCRA CORRECTIVE ACTION PLAN  
PENNWALT CORPORATION  
MID 005 363 114

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)  
AT  
PENNWALT CORPORATION  
WEST BRINE FIELD AREA

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas in the West Brine Field Area, as identified in the Status column (Column D) of Table One of this Scope of Work, and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation at Pennwalt Corporation, Wyandotte, Michigan.

SCOPE

The RCRA Facility Investigation consists of six tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination

Task II: Pre-Investigation Evaluation of Potential Corrective Measure Technologies

Task III: RFI Workplan Requirements

RFI Phase I

- A. Environmental Setting Characterization Plan
- B. Source Characterization Plan
- C. Potential Receptor Identification Plan
- D. Project Management Plan
- E. Data Collection Quality Assurance Plan
- F. Data Management Plan
- G. Health and Safety Plan
- H. Community Relations Plan

RFI Phase II

Contamination Characterization Plan

Task IV: West Brine Field Area Investigation

Task V: Investigation Analysis (Draft RFI Reports)

- A. Data Analysis
- B. Protection Standards

Task VI: Reports

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

## TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for U.S. EPA approval a report providing the background information pertinent to the West Brine Field Area and contamination as set forth below. The data gathered during previous investigations or inspections and other relevant data shall be included.

### A. West Brine Field Area Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general West Brine Field Area physiography, hydrogeology, and historical use of the West Brine Field Area for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:
  - a. General geographic location;
  - b. Property lines, with the owners of all adjacent property clearly indicated;
  - c. Topography and surface drainage (with a contour interval of 5 feet and a scale of 1 inch = 200 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface water containment areas;

- d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
- e. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;
- f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
- g. All known past and present product and waste underground tanks or piping; and
- h. Surrounding land uses (residential, commercial, agricultural, recreational).

All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

2. To the extent available from diligent inquiry, a history and description of ownership and operation, including former tenant operations, and of associated solid and hazardous waste, treatment, storage and disposal activities in the West Brine Field

3. To the extent available from diligent inquiry, approximate dates or periods of past product and waste spills of hazardous waste or Appendix IX hazardous constituents including, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and
4. A summary of past environmental permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the West Brine Field Area with respect to these environmental permits.

B. Nature and Extent of Contamination

The Respondent shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This should include all units and areas identified in the Status column of Table One of this Scope of Work. For each area, the Respondent shall identify the following:



- a. Location of unit/area (which shall be depicted on a West Brine Field Area map);
  - b. Quantities of solid and hazardous wastes, to the extent known;
  - c. Hazardous waste or constituents, to the extent known; and
  - d. Identification of areas where additional information may be necessary.
2. The Respondent shall prepare a preliminary assessment and description of the existing degree and extent of contamination. This should include:
- a. Available monitoring data and qualitative information on locations and levels of contamination at the West Brine Field Area;
  - b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
  - c. The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

TASK II: PRE-INVESTIGATION EVALUATION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES

In accordance with the Schedule, the Respondent shall submit to U.S. EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the West Brine Field Area investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

The RFI Workplan will be implemented in two phases. The focus of the first phase, "RFI Phase I," involves an investigation of the environmental setting, source characterization and identification of potential receptors which could be impacted by the contamination, if any, at the West Brine Field Area.

The second phase, "RFI Phase II," will be implemented after RFI Phase I has been completed. RFI Phase II will consist of a focused characterization of the contamination, if any, based upon the results of the RFI Phase I.

Subject to the provisions of Paragraph XII and XIX of the Consent Order, an RFI Phase III may be required which would consist of a focused investigation of areas beyond the West Brine Field Area boundary, to the extent required by

RCRA, if a final determination is made based on the RFI Phase II results that: 1) there has been a beyond boundary release of hazardous wastes or hazardous constituents from the West Brine Field Area; 2) beyond boundary corrective action may be necessary to protect human health and the environment; and 3) pursuant to Paragraph VIII(16) of the Consent Order, additional work is necessary.

Respondent will implement RFI Phases I and II, and if necessary, RFI Phase III in accordance with Task IV of this Scope of Work.

#### RFI Phase I

The Respondent shall prepare and submit to EPA for approval a RCRA Facility Investigation (RFI) Workplan I within the time period specified in the schedule included herein ("Schedule"). This RFI Workplan I shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the West Brine Field Area specific situation. The RFI Workplan I shall describe how the Respondent will conduct the following:

##### A. Environmental Setting Plan

The Respondent shall develop a plan to collect information to verify the existing information on the environmental setting in the West Brine Field Area. The plan shall include the following tasks:

1. Hydrogeology

The Respondent shall develop a plan to evaluate hydrogeologic conditions in the West Brine Field Area:

a. A description of the regional and West Brine Field Area specific geologic and hydrogeologic characteristics affecting ground water flow beneath the West Brine Field Area, including:

- i) Regional and West Brine Field Area specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
- ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
- iii) Depositional history;
- iv) Identification and characterization of areas and amounts of recharge and discharge;
- v) Regional and West Brine Field Area specific ground water flow patterns;

- vi) Characterize seasonal variations in the ground water flow regime; and
  - vii) Initial screening of groundwater quality at the West Plant based on Appendix IX constituents and waste stream specific hazardous constituents, to develop information to support a target constituent list (constituents of interest) for Phase II work.
- b. An analysis of any topographic features that might influence the ground water flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis).
- c. Based on field data, test, and cores, a representative and accurate classification and description of all hydrogeologic units which may be part of the migration pathways at the West Brine Field Area (i.e., the aquifers and any intervening saturated and unsaturated units), including:
- i) Hydraulic conductivity and porosity (total and effective);
  - ii) Lithology, grain size, sorting, degree of cementation;
  - iii) An interpretation of hydraulic interconnections between saturated zones; and

- iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).
- d. Based on field studies, cores, and structural geology, construct hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units, including bedrock, which may be part of the migration pathways identifying:
- i) All sand and gravel deposits in consolidated deposits;
  - ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
  - iii) Zones of high permeability or low permeability that might direct and restrict the flow of contaminants;
  - iv) Any aquifer: confined or unconfined, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and
  - v) Water bearing zones that may serve as a pathway for contaminant migration including perched zones of saturation.

- e. Based on data obtained from ground water monitoring wells and piezometers installed at the West Brine Field Area, a representative description of water level or fluid pressure monitoring including:
  - i) Water level contour and/or potentiometric maps;
  - ii) Hydrologic cross sections showing vertical gradients;
  - iii) The flow system, including the vertical and horizontal components of flow; and
  - iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.
- f. A description of man made influences that may affect the hydro-geology of the site, identifying:
  - i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
  - ii) Man made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention area etc.).

## 2. Soils

The Respondent shall develop a plan to characterize the soil units above the water table at the West Brine Field Area. Such characterization shall include but not be limited to, the following information:

- a. SCS soil classification;
- b. Surface soil distribution;
- c. Soil profile, including ASTM classification of soils;
- d. Transects of soil stratigraphy;
- e. Hydraulic conductivity (saturated and unsaturated);
- f. Relative permeability;
- g. Bulk density;
- h. Porosity;
- i. Soil sorptive capacity;
- j. Cation exchange capacity (CEC);



- k. Soil organic content;
- l. Soil pH;
- m. Particle size distribution;
- n. Depth of water table;
- o. Moisture content;
- p. Effect of stratification on unsaturated flow;
- q. Infiltration;
- r. Evapotranspiration;
- s. Storage capacity;
- t. Vertical flow rate;
- u. Mineral content; and
- v. Initial screening of soil quality based on Appendix IX constituents and waste stream specific hazardous constituents, to develop information to support a target constituent list (constituents of interest) for Phase II work.

### 3. Surface Water and Sediment

The Respondent shall develop a plan to characterize the drainage ditch in the West Brine Field Area. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the drainage ditch including:

- i) Location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);
- ii) Drainage patterns; and
- iii) Evapotranspiration.

b. Description of the chemistry of the water and sediments in the drainage ditch. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients  $[(\text{NH}_3, \text{NO}_3^-/\text{NO}_2^-, \text{PO}_4^{3-})]$ ,  $(\text{NH}_3, \text{NO}_3^-/\text{NO}_2^-, \text{PO}_4^{3-})$ , chemical oxygen demand, total organic carbon, and initial screening of drainage ditch sediment and water quality based on Appendix IX constituents and waste stream specific hazardous constituents, to develop information to support a target constituent list (constituents of interest) for Phase II work.

c. Description of sediment characteristics including:

- i) Depositional area;
- ii) Thickness profile; and
- iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity and pH).

4. Air

The Respondent shall develop a plan to provide information characterizing the climate in the vicinity of the West Brine Field Area. Such information shall include, but not be limited to:

a. A description of the following parameters:

- i) Annual and monthly rainfall averages;
- ii) Monthly temperature averages and extremes;
- iii) Wind speed and direction;
- iv) Relative humidity/dew point;

- v) Atmospheric pressure;
  - vi) Evaporation data;
  - vii) Development of inversion; and
  - viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.
- b. A description of topographic and man made features which affect air flow and emission patterns, including:
- i) Ridges, hills or mountain areas;
  - ii) Canyons or valleys;
  - iii) Surface water bodies (e.g., rivers, lakes, bays, etc.);
  - iv) Wind breaks and forests; and
  - v) Buildings.

B. Source Characterization Plan

The Respondent shall develop a plan to collect analytical data for waste characterization in the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and West Brine Field Area characteristics affecting release (e.g., West Brine Field Area security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area Characteristics:
  - a. Location of unit/disposal area;
  - b. Type of unit/disposal area;
  - c. Design features;
  - d. Operating practices (past and present);
  - e. Period of operation;
  - f. Age of unit/disposal area;
  - g. General physical conditions; and

h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

- vii) Density;
- viii) Boiling point;
- ix) Viscosity;
- x) Solubility in water;
- xi) Cohesiveness of the waste;
- xii) Vapor pressure; and
- xiii) Flash point.

c. Migration and dispersal characteristics of the waste;

- i) Sorption;
- ii) Biodegradability, bioconcentration, biotransformation;
- iii) Photodegradation rates;
- iv) Hydrolysis rates; and
- v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. Potential Receptor Identification Plan

The Respondent shall develop a plan to collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the West Brine Field Area. The plan will also require a literature search and review of relevant existing data on the chemical analysis of biological data and on observable effects in ecosystems. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:
  - a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
  - b. Location of ground water users including wells and discharge areas within a one mile radius of the West Brine Field Area.
2. Local uses and possible future uses of surface waters draining the West Brine Field Area:
  - a. Domestic and municipal (e.g., potable and lawn/garden watering);



- b. Recreational (e.g., swimming, fishing);
  - c. Agricultural;
  - d. Industrial; and
  - e. Environmental (e.g., fish and wildlife propagation).
3. Human use of or access to the West Brine Field Area and adjacent lands, including but not limited to:
- a. Recreation;
  - b. Hunting;
  - c. Residential;
  - d. Commercial;
  - e. Zoning; and
  - f. Relationship between population locations and prevailing wind direction.
4. A description of the biota in surface water bodies on, adjacent to, or affected by the West Brine Field Area.

5. A description of the ecology overlying and adjacent to the West Brine Field Area.
6. A demographic profile of the people who use or have access to the West Brine Field Area and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
7. A description of any endangered or threatened species near the West Brine Field Area.

D. Project Management Plan

The Respondent shall modify, to the extent necessary, the East Plant Project Management Plan to include discussion of the technical approach, schedules, budget, and personnel for the West Brine Field Area RFI. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the West Brine Field Area RCRA Facility Investigation.

E. Data Collection Quality Assurance Plan

The Respondent shall modify, to the extent necessary, the East Plant Quality Assurance Plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during the West Brine Field Area investigation to characterize the environmental setting,

source, and contamination. The plan is intended to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

#### 1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

- a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;
- b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
- c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:
  - i) Environmental conditions at the time of sampling;
  - ii) Number of sampling points;

- iii) Representativeness of selected media; and
  - iv) Representativeness of selected analytical parameters.
- d. Description of the measures to be taken to assure that the following data sets can be compared to each other:
- i) RFI data generated by the Owner/Operator over some time period;
  - ii) RFI data generated by an outside laboratory or consultant versus data generated by the Owner/Operator;
  - iii) Data generated by separated consultants or laboratories; and
  - iv) Data generated by an outside consultant or laboratory over some time period.
- e. A description of frequency of monitoring and information to be provided in quality assurance reports. The reports should include but not limited to:
- i) Periodic assessment of measurement data accuracy, precision, and completeness;

- ii) Results of performance audits;
- iii) Results of system audits;
- iv) Significant quality assurance problems and recommended solutions; and
- v) Resolutions of previously stated problems.

## 2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss the following:

- a. Selecting appropriate sampling locations, depths, etc.;
- b. Providing a statistically sufficient number of sampling sites;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which sampling should be conducted;
- e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;

- g. Selecting the frequency of sampling and length of sampling period;
- h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- i. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- j. Documenting field sampling operations and procedures, including:
  - i) Documentation of procedure for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
  - ii) Procedure and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation method;
  - iv) Calibration of field devices;
  - v) Collection of replicate samples;
  - vi) Submission of field-biased blanks, where appropriate;

- vii) Potential interferences present at the West Brine Field Area;
  - viii) Construction materials and techniques, associated with monitoring wells and piezometers;
  - ix) Sampling order; and
  - x) Decontamination procedures.
- k. Selecting appropriate sample containers;
- l. Sample preservation; and
- m. Chain-of-custody, including:
  - i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and
  - ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

### 3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

- a. Selecting appropriate field measurement locations, depths, etc.;
- b. Providing a statistically sufficient number of field measurements;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which field measurement should be conducted;
- e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of field measurement and length of field measurement period; and
- h. Documenting field measurement operations and procedures, including:



- i) Procedures and forms for recording raw data and the exact location, time, and West Brine Field Area-specific considerations associated with the data acquisition;
- ii) Calibration of field devices;
- iii) Collection of replicate measurements;
- iv) Submission of field-biased blanks, where appropriate;
- v) Potential interferences present at the West Brine Field Area;
- vi) Construction materials and techniques associated with monitoring wells and piezometers use to collect field data;
- vii) Field equipment listing;
- viii) Order in which field measurements were made; and
- ix) Decontamination procedures.

#### 4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

- a. Chain-of-custody procedures, including:
  - i) Identification of a responsible party to act as sample custodian at the laboratory West Brine Field Area authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
  - ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
  - iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.
- b. Sample storage procedures and storage times;
- c. Sample preparation methods;
- d. Analytical procedures, including:

- i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology; and
  - v) Method detection of limits.
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting;
- g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
  - i) Method blank(s);
  - ii) Laboratory control sample(s);
  - iii) Calibration check sample(s);
  - iv) Replicate sample(s);
  - v) Matrix-spiked sample(s);

- vi) "Blind" quality control sample(s);
- vii) Control charts;
- viii) Surrogate samples;
- ix) Zero and span gases; and
- x) Reagent quality control checks.

A performance audit will be conducted by U.S. EPA on the laboratories selected by the Respondent. This audit must be completed and approved prior to the approval of the Quality Assurance Procedure Plan (QAPP) for the West Brine Field Area.

- h. Preventive maintenance procedures and schedules;
- i. Corrective action (for laboratory problems); and
- j. Turnaround time.

F. Data Management Plan

The Respondent shall modify, to the extent necessary, the East Plant Data Management Plan to document and track the West Brine Field Area investigation data and results. This plan shall identify and set up data

documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

## 1. Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;
- b. Sampling or field measurement location and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measured; and
- f. Result of analysis (e.g., concentration).

## 2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis;
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

### 3. Graphical Displays

Both historical data and data required as part of this RFI shall be presented in generally accepted formats for ease of interpretation. The data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc). The application of graphical displays shall be used to:

- a. Display sampling location and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data are required;
- c. Display levels of contamination at each sampling location;

- d. Display geographical extent of contamination;
- e. Display contamination levels, averages, and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- g. Indicate features affecting intramedia transport and show potential receptors.

G. Health and Safety Plan

The Respondent shall modify, to the extent necessary, the East Plant Health and Safety Plan for the West Brine Area RFI.

1. Major elements of the Health and Safety Plan shall include:
  - a. West Brine Field Area description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted including, but not limited to, on and off-site exposure to contaminants during the implementation of interim measures at the West Brine Field Area;

- c. List key personnel and alternates responsible for site safety, response operations, and for protection of public health;
- d. Delineate work area;
- e. Describe levels of protection to be worn by personnel in work area;
- f. Establish procedures to control site access;
- g. Describe decontamination procedures for personnel and equipment;
- h. Establish site emergency procedures;
- i. Address emergency medical care for injuries and toxicological problems;
- j. Describe requirements for an environmental surveillance program;
- k. Specify any routine and special training required for responders; and
- l. Establish procedures for protecting workers from weather-related problems.



2. The Facility Health and Safety Plan shall be consistent with:

- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- b. U.S. EPA Order 1440.1 - Respiratory Protection;
- c. U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- d. West Brine Field Area Contingency Plan;
- e. U.S. EPA Standard Operating Safety Guide (1984);
- f. OSHA regulations particularly in 29 CFR 1910 (as amended on December 19, 1986) and 1926;
- g. State and local regulations; and
- h. Other U.S. EPA guidance as provided.

H. Community Relations Plan

The Respondent shall modify, to the extent necessary, the East Plant Community Relations Plan for the dissemination of information to the public regarding the West Brine Field Area investigation activities and results.

## RFI Phase II

The Respondent shall prepare and submit to U.S. EPA for approval an RFI Phase II Workplan within the time specified in the Schedule. The focus of the RFI Phase II Workplan will be on contaminant characterization in the West Brine Field Area and will be based on the data obtained in the approved RFI Phase I Final Report.

RFI Workplan II shall describe how the Respondent will conduct the following:

### Contamination Characterization Plan

The Respondent shall develop a plan to collect analytical data on ground water, soils, surface water, and sediment in the West Brine Field Area. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identify of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination in the West Brine Field Area:

#### 1. Ground Water Contamination

The Respondent shall develop a ground water investigation plan to characterize plumes of contamination, if any, at the West Brine Field Area with respect to those constituents of interest identified in the

RFI Phase I. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the West Brine Field Area;
- b. The horizontal and vertical direction of contamination movement;
- c. The velocity of contaminant movement;
- d. The horizontal and vertical concentration profiles of constituents of interest which are identified in the RFI Phase I in the plume(s);
- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

## 2. Soil Contamination

The Respondent shall develop a plan to characterize the contamination, if any, of the soil fill above the water table in the vicinity of the contaminant release with respect to those constituents of interest identified in the RFI Phase I. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination;
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;
- c. Specific contaminant concentrations;
- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement; and

The Respondent shall document the procedures used in making the above determinations.

### 3. Surface Water and Sediment Contamination

The Respondent shall develop a surface water investigation plan to characterize contamination, if any, in the drainage ditch resulting from contaminant releases in the West Brine Field Area with respect to those constituents of interest identified in the RFI Phase I.

The investigation shall include, but not be limited to, the following information:

- a. A description of the chemistry of the contaminated surface water and sediments in the drainage ditch. This includes determining the pH, total dissolved solids, specific contaminant concentrations.
- b. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the drainage ditch.
- c. The horizontal and vertical direction of contaminant movement;
- d. The contaminant velocity;
- e. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

- f. An extrapolation of future contaminant movement; and

The Respondent shall document the procedures used in making the above determinations.

#### 4. Air Contamination

The Respondent shall develop an air contamination investigation plan to characterize the particulate and gaseous contaminants released to the atmosphere from units and other source areas identified in the Status column of Table One, or document why there is no need to conduct an investigation. This investigation, if required, shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of the release; and
- c. The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

The Respondent shall document the procedures used in making the above determinations.

## 5. Subsurface Gas Contamination

The Respondent shall develop a plan to characterize subsurface gases in the groundwater emitted from buried hazardous waste and hazardous constituents from units and other source areas identified in the Status column of Table One, or document why there is no need to conduct an investigation. This investigation, if required, shall include the following information:

- a. A description of the horizontal and vertical extent of subsurface gases mitigation;
- b. The chemical composition of the gases being emitted;
- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

#### TASK IV: WEST BRINE FIELD AREA INVESTIGATION

Upon notice of EPA approval, the Respondent shall implement RFI Workplan I, and subsequent RFI Workplan II pursuant to the approved schedules therein which set forth those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analysis shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.



## TASK V: INVESTIGATION ANALYSIS

The Respondent shall prepare and submit to EPA, in accordance with the Schedule herein, a draft RFI Report for Phase I, and a subsequent draft RFI Report for Phase II, that shall contain an analysis and summary of all West Brine Field Area investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

### A. Data Analysis

The Respondent shall analyze all West Brine Field Area investigation data obtained in Task IV and the previous studies and prepare a report(s) on the type and extent of contamination at the West Brine Field Area including sources and migration pathways. The report(s) shall describe the extent of contamination, (qualitative/quantitative) in relation to background levels indicative for the area identify the applicable health and environmental criteria and assess the potential threat to human health and the environment. U.S. EPA will use the report(s) to determine the need for Corrective Measures with respect to each Solid Waste Management Unit ("SWMU") and other potential source area studied in the RFI. Pursuant to Paragraph VIII(7) of this Order, U.S. EPA shall make

preliminary written determination as to the need for a CMS, identifying which SWMU's require corrective action and shall submit a copy of the preliminary determination to Respondent.

B. Protection Standards

1. Ground Water Protection Standards

The Respondent shall provide information to support the Agency's selection/development of Ground Water Protection Standards for all of the constituents of interest found in the ground water during the Facility Investigation (Task IV).

a. The Ground Water Protection Standards shall consist of:

- i) for any constituents listed in Table 1 of 40 CFR 264.94, the respective value given in the table (MCL) if the background level of the constituent is below the given in Table 1; or
- ii) the background level of that constituent in the ground water; or
- iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

- b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by the Respondent in accordance with U.S. EPA guidance. For any proposed ACL's the Respondent shall include a justification based upon the criteria set forth in 40 CFR 264.94(b).
- c. The U.S. EPA shall notify the Respondent in writing of approval, disapproval or modifications, at any proposed ACL, the notice shall include the reason(s) for any disapproval or modification; and
- d. Within thirty (30) days of receipt of the U.S. EPA's notification of disapproval of any proposed ACL, the Respondent shall amend and submit revisions to the U.S. EPA.

## 2. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

## TASK VI: REPORTS

### A. Preliminary and Workplan

The Respondent shall submit to the U.S. EPA reports on Task I and II and the RCRA Facility Investigation Workplans in accordance with the time limits set forth in the schedule.

### B. Progress

The Respondent shall at a minimum provide the U.S. EPA with signed, bimonthly progress reports containing the following information with respect to the RFI program:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, and summaries of laboratory/monitoring data.

C. Draft and Final

Upon U.S. EPA approval, the Respondent shall prepare the RCRA Facility Investigation Phase I and Phase II, Reports to present Tasks IV-V. The RCRA Facility Investigation Reports shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Reports shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Reports.

Five (5) copies of all reports, including the Task I report, Task II report, Task III workplans, and both the Draft and Final RCRA Facility Investigation Phase I, and, if necessary, Phase II, Reports (Task IV-V shall be provided by the Respondent to U.S. EPA.

### West Brine Field Area Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

WEST BRINE FIELD AREA SUBMISSION	DUE DATE *
TASK I: DESCRIPTION OF CURRENT CONDITIONS	WITHIN 240 DAYS OF EFFECTIVE DATE OF ORDER
TASK II: PRE-INVESTIGATION EVALUATION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES	WITHIN 420 DAYS OF EFFECTIVE DATE OF ORDER
TASK III: RFI WORKPLAN	WITHIN 420 DAYS OF EFFECTIVE DATE OF ORDER
TASK IV: IMPLEMENTATION OF APPROVED RFI WORKPLAN I	IN ACCORDANCE WITH THE SCHEDULE IN THE APPROVED RFI WORKPLAN I
TASK III: RFI WORKPLAN II	WITHIN 90 DAYS OF RECEIPT OF U.S. EPA WRITTEN APPROVAL OF FINAL RFI REPORT I
TASK IV: IMPLEMENTATION OF APPROVED RFI WORKPLAN II	IN ACCORDANCE WITH THE SCHEDULE IN THE APPROVED RFI WORKPLAN II
TASK V: DRAFT RFI REPORT I	IN ACCORDANCE WITH SCHEDULE IN THE APPROVED RFI WORKPLAN I

<sup>1</sup>As finalized pursuant to Paragraph XIX of this Order.

\*All due dates are calculated from the effective date of this Order unless otherwise specified.

WEST BRINE FIELD AREA SUBMISSION	DUE DATE *
TASK V: FINAL RFI REPORT I	WITHIN 60 DAYS OF RECEIPT OF U.S. EPA COMMENTS <sup>1</sup> ON DRAFT RFI REPORT I
TASK V: DRAFT RFI REPORT II	IN ACCORDANCE WITH SCHEDULE IN RFI PHASE II WORKPLAN
TASK V: FINAL RFI REPORT II	WITHIN 60 DAYS OF RECEIPT OF U.S. EPA COMMENTS <sup>1</sup> ON DRAFT RFI REPORT II <sup>1</sup>
TASK VI: PROGRESS REPORTS ON TASKS I THROUGH V	BIMONTHLY BY THE 15TH DAY OF THE MONTH FOLLOWING THE COMPLETED REPORTING PERIOD

<sup>1</sup>As finalized pursuant to Paragraph XIX of this Order.

\*All due dates are calculated from the effective date of this Order unless otherwise specified.

WEST BRINE FIELD AREA SCOPE OF WORK

TABLE ONE

Solid Waste Management Units  
And Other Source Areas

<u>A. Identification</u>	<u>B. Description</u>	<u>C. Contents</u>	<u>D. Status*</u>
1) Former Landfill No. 1	Landfill	Bulk amyl phenol- clay filter cake	Included
2) Former Landfill No. 2	Landfill	Drums of amyl phenol, primarily still bottoms; still bottoms are corrosive	Included
3) Former Landfill No. 3	Landfill	Amyl phenol-clay filter cake and drummed still bottoms; still bottoms are corrosive	Included
4) Former Landfill No. 4	Landfill	Bulk amyl phenol- clay filter cake	Included

\* Status indicates whether the source area will be included in the investigation outlined in the RFI Scopes of Work.

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ATTACHMENT IV  
CORRECTIVE MEASURE STUDY  
EAST PLANT, WEST PLANT AND  
WEST BRINE FIELD AREA

RCRA CORRECTIVE ACTION PLAN  
PENNWALT CORPORATION  
MID 005 363 114

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V

## Attachment IV

### SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY

#### AT

#### PENNWALT CORPORATION

### INTRODUCTION

This Scope of Work shall apply to any solid waste management unit (SWMU) or other area of concern within the scope of the East Plant, West Plant or West Brine Field Area RCRA Facility Investigations for which a final determination has been made that a Corrective Measure Study is necessary. With respect to the East Plant, West Plant and West Brine Field Area, as each final written determination of the need for a Corrective Measure Study(ies) is received, the Corrective Measure Study(ies) will be conducted. With respect to the West Plant, the scope and timing of any study will be determined taking into account the operational needs of the facility and may be adjusted to fit the requirements for phased and/or conditional remedies, if appropriate.

### PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken, if

necessary, at SWMU's or other areas of concern where it has been determined, based on the findings of the RCRA Facility Investigations and pursuant to Paragraph VIII of the Consent Order, that a CMS must be performed. The Respondent will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

#### SCOPE

The Corrective Measure Study consists of four tasks:

- Task I: Identification and Development of the Corrective Measure Alternative or Alternatives
  - A. Description of Current Situation
  - B. Establishment of Corrective Action Objectives
  - C. Screening of Corrective Measures Technologies
  - D. Identification of the Corrective Measure Alternative or Alternatives
  - E. Laboratory and Bench-Scale Studies
- Task II: Evaluation of the Corrective Measure Alternative or Alternatives
  - A. Technical/Environmental/Human Health/ Institutional
  - B. Cost Estimate
- Task III: Justification and Recommendation of the Corrective Measure or Measures
  - A. Technical
  - B. Environmental
  - C. Human Health
  - D. Costs
- Task IV: Reports
  - A. Preliminary Corrective Measure Technologies Report
  - B. Progress Reports
  - C. Draft CMS Report
  - D. Final CMS Report

TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION  
ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation (RFI) and consideration of the identified Preliminary Corrective Measure Technologies (Task V of the RFI), the Respondent shall identify, screen and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action. The Respondent shall describe each corrective measure alternative and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health, and institutional concerns.

After completion of Task I and prior to commencing the corrective measure evaluations required in Tasks II and III, the Respondent shall prepare and submit to U.S. EPA for approval a Preliminary Corrective Measure Technologies (PCMT) Report, in accordance with the schedule contained herein (Schedule). The PCMT Report shall include information developed pursuant to Paragraphs A-E below.

A. Description of Current Situation

The Respondent shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA

Facility Investigation Report. The Respondent shall provide an update to information presented in Task I of the RFI to the Agency regarding previous response activities and any interim measures which have been or are being implemented at the facility. The Respondent shall also make a Facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Respondent shall propose for U.S. EPA review and approval, Facility-specific objectives for the Corrective Action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, U.S. EPA guidance, and the requirements of any applicable Federal statutes. All corrective actions concerning ground water releases from regulated units must be consistent with those required under 40 CFR 264.100, or as otherwise required by law.

C. Screening of Corrective Measure Technologies

The Respondent shall review the results of the RCRA Facility Investigation to reassess the technologies specified in Task II of

the RFI and to identify additional technologies which are applicable at the facility. The Respondent shall screen the preliminary corrective measure technologies identified in Task II of the RCRA Facility Investigation and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

## 2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

## 3. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. Identification of the Corrective Measure Alternative or Alternatives

The Respondent shall develop the corrective measure alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task II of the RCRA Facility investigation and as supplemented following the preparation of the RFI Report. The Respondent shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives. The alternatives identified for the Halowax area shall meet the goals, objectives and requirements of Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA) and shall be consistent with the National Contingency Plan (NCP).



E. Laboratory and Bench-Scale Studies

The Respondent shall conduct laboratory and/or bench-scale studies to support the list of potential corrective measure alternatives which pass through the Initial Screening in Task I. The Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements. The Respondent shall develop and submit a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation. The testing plan shall be included in the PCMT Report for U.S. EPA review and approval. Implementation of the testing plan shall be conducted under Task II of the CMS.

TASK II: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Respondent shall describe each corrective measure alternative that passes through the Initial Screening in Task I and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Respondent shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Respondent shall evaluate each alternative in the four following areas:

1. Technical;

The Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

a. The Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measure: .

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies.

Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. The Respondent shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:

1) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

11) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination

of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. The Respondent shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:

1) Constructability is determined by conditions both internal and external to the facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

- ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.
  - iii) For the West Plant, the Respondent's description of the implementability of each corrective measure shall take into account the operational needs of the facility and shall also consider phased and conditional remedies, if appropriate.
- d. The Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.
- e. The Respondent shall implement the approved laboratory and bench-scale testing plan to determine the applicability of(a) corrective

measure technology(ies) to facility conditions. Upon completion of the testing, the Respondent shall evaluate the testing results to assess the technology(ies) with respect to site-specific questions identified in the approved test plan. The results of the testing program shall be included in the Draft CMS Report.

2. Environmental;

The Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short-and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health; and

The Respondent shall assess each alternative in terms of the extent of which it mitigates short- and long-term potential exposure to any residual contamination and

protects human health both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected population. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to U.S. EPA.

#### 4. Institutional.

The Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

For the Hallowax area, the Respondent shall also evaluate each alternative with respect to the goals, objectives and requirements of Section 121 of CERCLA and consistency with the NCP.



B. Cost Estimate

The Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

- a. Direct capital costs include:

- i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure;
- ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;
- iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

iv) Buildings and services costs: Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii) Startup and shakedown costs: Costs incurred during corrective measure startup; and

iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Respondent shall consider the following operation and maintenance cost components:

- a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;
- b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;
- c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;
- d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;
- e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

- f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;
- g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;
- h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and
- i. Other costs: items that do not fit any of the above categories.

TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE  
MEASURE OR MEASURES

The Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria developed in Task II, as well as cost effectiveness. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors, including ongoing manufacturing concerns, shall be highlighted. The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks II and III. For the Halowax area, the selection of the corrective measure alternative(s) shall be consistent with the provisions of Section 121 of CERCLA and consistent with the NCP. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and facility conditions similar to those anticipated will be given preference;
3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; for the West Plant, corrective measures which take into account the operational needs of the facility and the requirements for phased and conditional remedies, if appropriate; and
4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during the implementation will be preferred.

#### B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred. For the Hallowax area, the corrective

measure must comply with the requirements of Section 121 of CERCLA and must be consistent with the NCP.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

D. Costs

The total cost of the corrective measure(s) may be considered when deciding between two or more corrective measure alternatives which are deemed acceptable when evaluated for technical, human health, and environmental criteria. Total cost will include the cost of implementing the measure or measures and the cost of operation and maintenance.

#### TASK IV: REPORTS

##### A. Preliminary Corrective Measure Technologies Report

In accordance with the Schedule, the Respondent shall submit to U.S. EPA for approval a Preliminary Corrective Measure Technologies (PCMT) Report presenting the results of Task I of the CMS. Five (5) copies of the PCMT Report shall be provided by the Respondent to U.S. EPA.

##### B. Progress Reports

The Respondent shall at a minimum provide the U.S. EPA with signed, bimonthly, progress reports containing the following information with respect to the CMS program:

1. A description and estimate of the percentage of the CMS completed;
2. Summaries of all findings;
3. Summaries of all changes made in the CMS during the reporting period;



### Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
Preliminary Corrective Measure Technologies Report (Task I)	90 days after receipt of final written determination of the need for a CMS, pursuant to Paragraph VIII of the Consent Order
Draft CMS Report (Tasks II and III)	In accordance with the schedule in the PCMT Report
Final CMS Report (Tasks II and III)	In accordance with the schedule in the Draft CMS Report and after the opportunity for public and U.S. EPA comment on the Draft CMS
Progress Reports Reports on Tasks I, II and III	Bimonthly by the 15th day of the month following the completed reporting period

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4. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;
4. Summaries of all problems or potential problems encountered during the reporting period;
5. Actions being taken to rectify problems;
6. Changes in personnel during reporting period; and
7. Projected work for the next reporting period.
9. Copies of daily reports, inspection reports, and summaries of laboratory/monitoring data.

C. Draft CMS Report

The Draft CMS Report shall present the results of Tasks II and III and shall include:

1. A description of the facility;
  - a. Site topographic map and preliminary layouts.

2. A summary of the corrective measure or measures;
  - a. Description of the corrective measure or measures and rationale for selection;
  - b. Performance expectations;
  - c. Preliminary design criteria and rationale;
  - d. General operation and maintenance requirements;
  - e. Long-term monitoring requirements; and
  - f. Laboratory and bench-scale studies.
3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;
  - a. Field studies (ground water, surface water, soil, air).
4. Design and Implementation Precautions;
  - a. Special technical problems;
  - b. Additional engineering data required;

c. Permits and regulatory requirements;

d. Access, easements, right-of-way;

e. Health and safety requirements; and

f. Community relations activities.

5. Cost Estimates and Schedules;

a. Capital cost estimate;

b. Operation and maintenance cost estimate; and

c. Project schedule (design, construction, operation).

6. Recommended Corrective Measure Alternative(s).

Five (5) copies of the draft shall be provided by the Respondent to U.S. EPA.

D. Final CMS Report

The Respondent shall finalize the Corrective Measure Study Report incorporating comments received from U.S. EPA, as finalized through Paragraph XIX of the Consent Order, on the Draft Corrective Measure Study Report.